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Macworld

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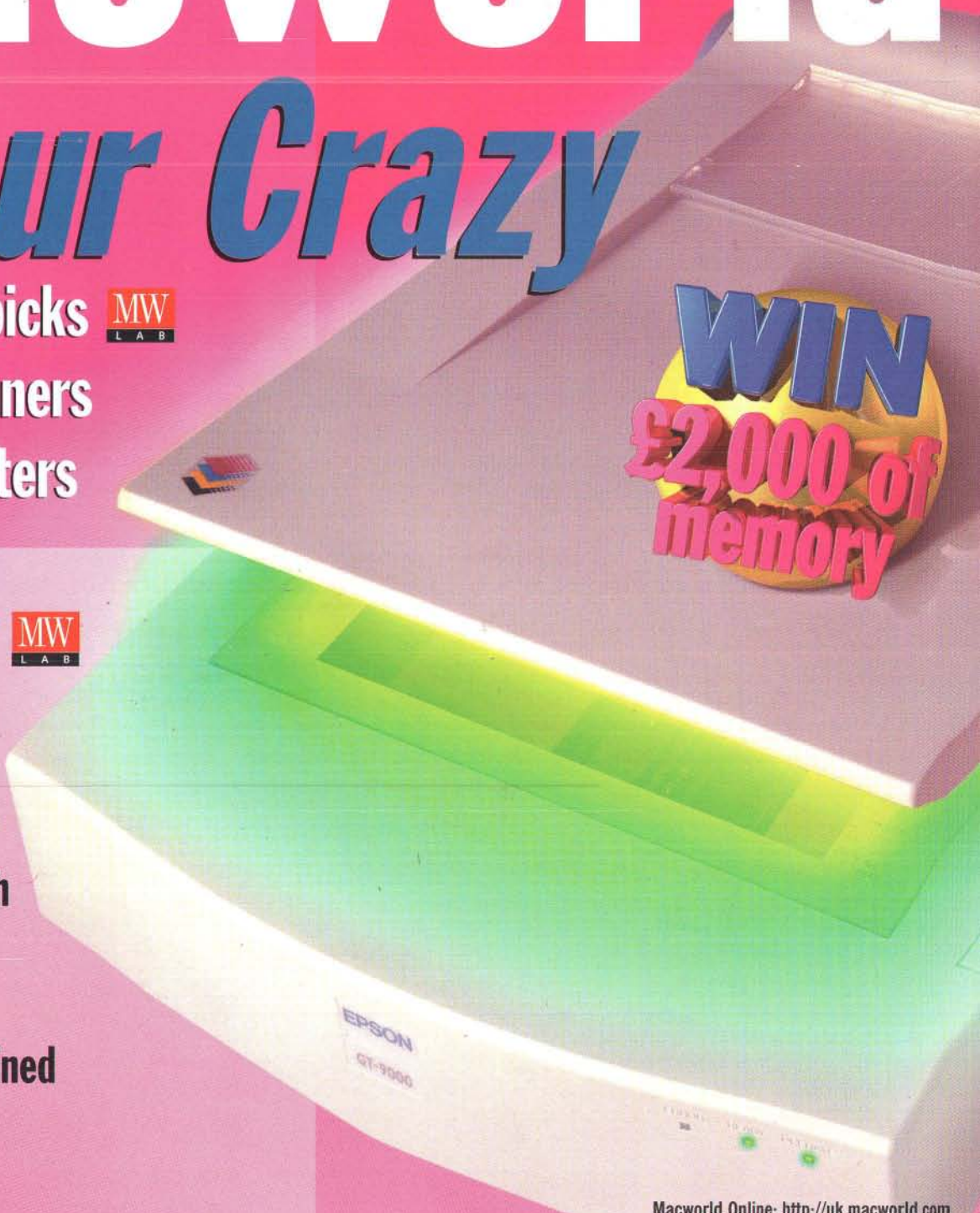

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TOPAZ, SAPHIR and now the OPAL A3 desktop scanner are three professional colour management solutions from Linotype-Hell.

Designed to meet different business needs, they all have one thing in common – LinoColor.

LinoColor/LinoColor Lite is the powerful colour repro software developed by Linotype-Hell to drive its Macintosh-based scanners.

In fact, it is the core technology used by Apple for its industry standard colour management software, ColorSync 2.0.

However, just because LinoColor is the professional colour management system doesn't mean it's complicated.

The software achieves repro colour scans simply because it's so easy to operate.

Its ColorAssistant module allows one-button image processing.

You don't need years of experience to process colour, just use your eyes.

With LinoColor's LCH interface, you can adjust colour as your eyes see it using the parameters of luminance, chroma and hue.

Productivity is never far from the mind of the colour professional.

That's why unattended batch scanning is such an important aspect of the award winning TOPAZ scanner.

And why both SAPHIR and OPAL offer a multiscan function for batch scanning of reflective and transparent originals.

Of course, with OPAL's A3 format, the benefits of high productivity are considerably enhanced.

With its tri-linear CCD technology so are the advantages of high quality too.

The scanner's double lens allows users to optimise resolution to the size of the original.

OPAL comes with a whole range of software packages and plug-ins including Adobe Photoshop Full Edition, ScanLite Photoshop plug-in, Cumulus image database and ScanOpen ICC Lite in addition to LinoColor Lite.

With a list price of under £10,000, a repro quality scanning solution is now well within bureaux', designers' and publishers', in fact, every colour professional's reach.

For the name of your nearest OPAL distributor check the list here or contact the Linotype-Hell Infoline on 01242 285065 or Fax: 01242 285141.

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Macworld

Inside this issue...

It's 3am and I'm still in the office, churning out the last few pages of *Macworld* for your pleasure and professional satisfaction.

Staying late at the office is not an uncommon situation for a lot of our readers, I'm sure. My Production Editor is flat out in bed with glandular fever, and I'm stuck in the Ruud Gullit sweeper role to fill in the gaps. XPress has added Collect For Output since I last did this, so I can put my feet up and drain a few cans and, like *Macworld* columnist Michael Prochak (see page 55), ponder the merits of new technology.

Michael, cultured soul that he is, dreams of Penguin paperbacks when he curses lousy CD-ROMs. In my current position, with only copies of Radiohead's *The Bends* and The Beatles' *Abbey Road* to keep me company, I can only wonder when CD-ROMs are ever going to match audio discs for long-lasting value. I've been forced to listen to two CDs for over seven hours, and have not been bored for a moment – OK, *Octopus's Garden* is a drag second-time round, but...

In this issue we've started reviewing a couple of entertainment CD-ROMs in our new Review's Home Page (page 96). Many of us have Macs at home, and some of us even use them in our spare time. Apple's new bosses (see page 36) reckon that the so-called 'new media' is a hot ticket, so we'll give it a shot – but, Myst apart, shouldn't Apple be thinking a little bigger, given its present purse squeezing?

The Internet, yes; multimedia, certainly; publishing, of course. But silly CDs over serious business – are you kidding, boys... or just running scared? Go for profits by all means, but don't consign the Macintosh to niche markets, Apple. After all, isn't the Mac meant to be 'for the rest of us'?

– SIMON JARY, EDITOR

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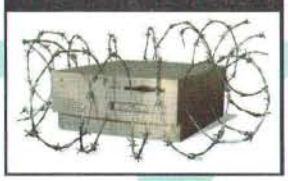

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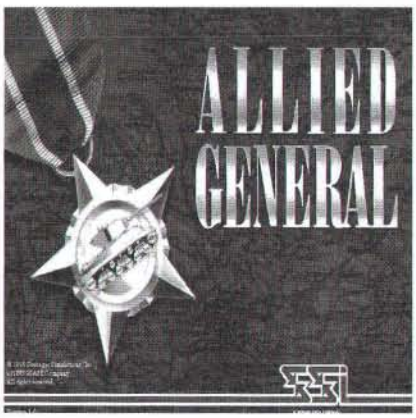
Macworld

Welcome to the April CD and Cover Disk. This month the CD-ROM contains the first-ever showing of Shockwave for Director on a cover CD in the UK, plus a fabulous playable game demo of Allied General. Try out the showcase multimedia demo versions of Winnie the Witch and Dragons, two multimedia storybooks from Oxford CD-ROMs. ALSO OVER 600 of the most useful, fun and up-to-date shareware games and utilities. But foremost - Shockwave for Director and Afterburner.



Shockwave for Director

Macromedia Director and Shockwave for Director together provide the solution for creating multimedia on the Internet. Shockwave enables the playback of high-impact multimedia on the World Wide Web, setting a new level of interactive performance on the Internet. Shockwave powers Netscape Navigator 2.0 with support coming for other leading browser's on the way. We invite you to take a test drive with a beta version of the plug-in on this month's cover-mounted CD-ROM. For the latest version, visit Macromedia's web site, **www.macromedia.com**. Using Director 4.0, with Shockwave at no extra charge, registered users can quickly create multimedia productions, even leverage existing multimedia content, for the rapid distribution of high-quality multimedia for the Internet. Use Director 4.0 to produce interactive movies for lower Internet bandwidths today. Shockwave provides media-specific compression, network linking through Universal Resource Locators (URLs), and helpful authoring techniques.

In addition to the plug-in, Macromedia has released AfterBurner, a free development tool used to compress Director movies so they can be transmitted over the Internet.

Afterburner can compress a Director movie by as much as 60 per cent. Afterburner is also included on this month's CD-ROM. For the latest version visit Macromedia's web site, **www.macromedia.com**. Should you have any trouble installing or running the plug-in, just visit Macromedia's web site.

If you're more interested in viewing than creating multimedia, drop the Shockwave plug-in into the plug-ins folder of Netscape Navigator 2.0, and you're ready to go. For a list of 'shocked' Web sites, visit **www.shocker.com**.

DEMOS

Allied General

Check out this excellent demo from Mindscape. Allied General puts you in command of the Allied forces in World War II's three main theatres of war – North Africa, Europe and Russia.

Winnie the Witch

Behold, the magical world of Winnie the Witch awaits you! Fun and educational elements mean children practice essential skills without even realising it.

Dragons!

Enter the Dragon's lair at your peril! Explore the labyrinth of tunnels and you'll find every kind of dragon you could ever imagine, and even some you can't.

HexWeb XT

HexWeb XT is a new XTension from HexMac that lets new or existing QuarkXPress documents to be translated and formatted as Web pages for the Internet.

FontConsultant 1.0

FontConsultant is a powerful new tool for managing, examining and selecting typefaces on the Mac. You can e-mail FontWorks at **info@type.co.uk** . You can also browse FONTNET at **http://www.type.co.uk.**

Klick & Play

Once you've seen what Klick & Play is capable of, quit and double click on K&P

continues page 6

Macworld

Tutorial 1. This will take you through the creation of a simple breakout style game, load Klick & Play again and follow the steps. Two important hints: to call up a menu, double click and then hold the mouse button down; plus, you have to quit and reload to get back to the main menu.

Encyclopaedia of Nature
A demo of Dorling Kindersley's nature study.

Goldilocks Gamebook
A game from the children's book.

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The Adventures of Sean!
Interactive comic book.

Another Fine Mess
Puzzles inside puzzles.

GopherGolf
Miniature golf game for Macintosh.

KGB 1.0
Kill the evil lord who tries to rule the world.

MacTriv 3.2
MacTriv 3.2 has separate windows for the board, the dice and the 'wedges' racks. The board is a rectangular matrix of picture squares, each representing a category of question, or a 'throw again' square.

Short Circuit v 1.2.1
An action puzzle game.

The Talking Spelling Bee
Interactive spelling game.

UTILITIES

Facade V1.09
Facade attaches files to your System file to enhance or augment it with icons, sounds, windows, buttons and/or scrolls.

WindowMenu V 1.1
WindowMenu lets you jump directly to a specific window in an application. It pops up a menu of all open windows in the current application and lets you select one directly.

MyEyes V1.12
MyEyes draws on the menubar a pair of eyes constantly following the cursor movement.

CacheBGone!
CacheBGone! automatically gets rid of the Netscape "Cache" folder, and the "Global History" file – useful for when Netscape slows to a crawl sifting through a million cache files it has created.

BigSecret 3.0
BigSecret lets you make files or folders totally invisible. Useful if you don't want your boss to see your games folder.

This month's HD features two cool games, several useful utilities for your Macintosh, a superb new demo utility to try out, and a Personality Test

Connect 4
You can play against your Mac or with a friend. Provides varying levels of difficulty for more competitive players.

Romi 1.21
Played with two packs of cards and two free cards. The purpose of this game is to form groups of three or more cards, which contain either consecutive cards of the same suit, or cards of the same number value but differing suits.

SCREENS
Change StartUp Screens v1.0
Although it will work from the desktop, it was designed for use inside the Startup Items so that the picture will change each time you restart.

Cyber v1.1
AfterDark Screen Saver module. Just move the file called "Cyber" into the "After Dark Items" folder, which will be in your system folder, or in another folder inside the system folder. Now Cyber will appear in the list of screen savers when you open the After Dark control panel, and you can use it like any of your other screen savers.

UTILITIES

NetLink Remote Demo
NetLink Remote is a Network Control Panel item that gives AppleTalk the ability to use a modem as its network hardware. This means that when you connect with NetLink, you will have access to all of the normal AppleTalk services. You can use AppleShare™ to move files and you can play AppleTalk games like Marathon and F/A-18 Hornet. Just about any thing that is possible when two Macs connect on a Local Area Network can be done with NetLink Remote.

Mount Everything
1. Shows SCSI peripheral type.
2. Mount any single partition or entire disk at a time
3. Start or stop each drive without rebooting your Mac
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Personality Test 1.4
FIND OUT WHAT REALLY MAKES YOU TICK!

FAULTY COVER DISK?

If your floppy cover disk doesn't seem to work as it should, then you can send it back to us. Before you do this, please read all the instructions on the cover disk pages carefully. If after that it still doesn't work, phone the DiskExpress helpline on 01451 810 788 between 10am and 5pm from Monday to Friday.

If the disk does finally turn out to be faulty, fill in the form below and send it with the disk and a 28p stamped self-addressed envelope to:

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Name _____

Address _____

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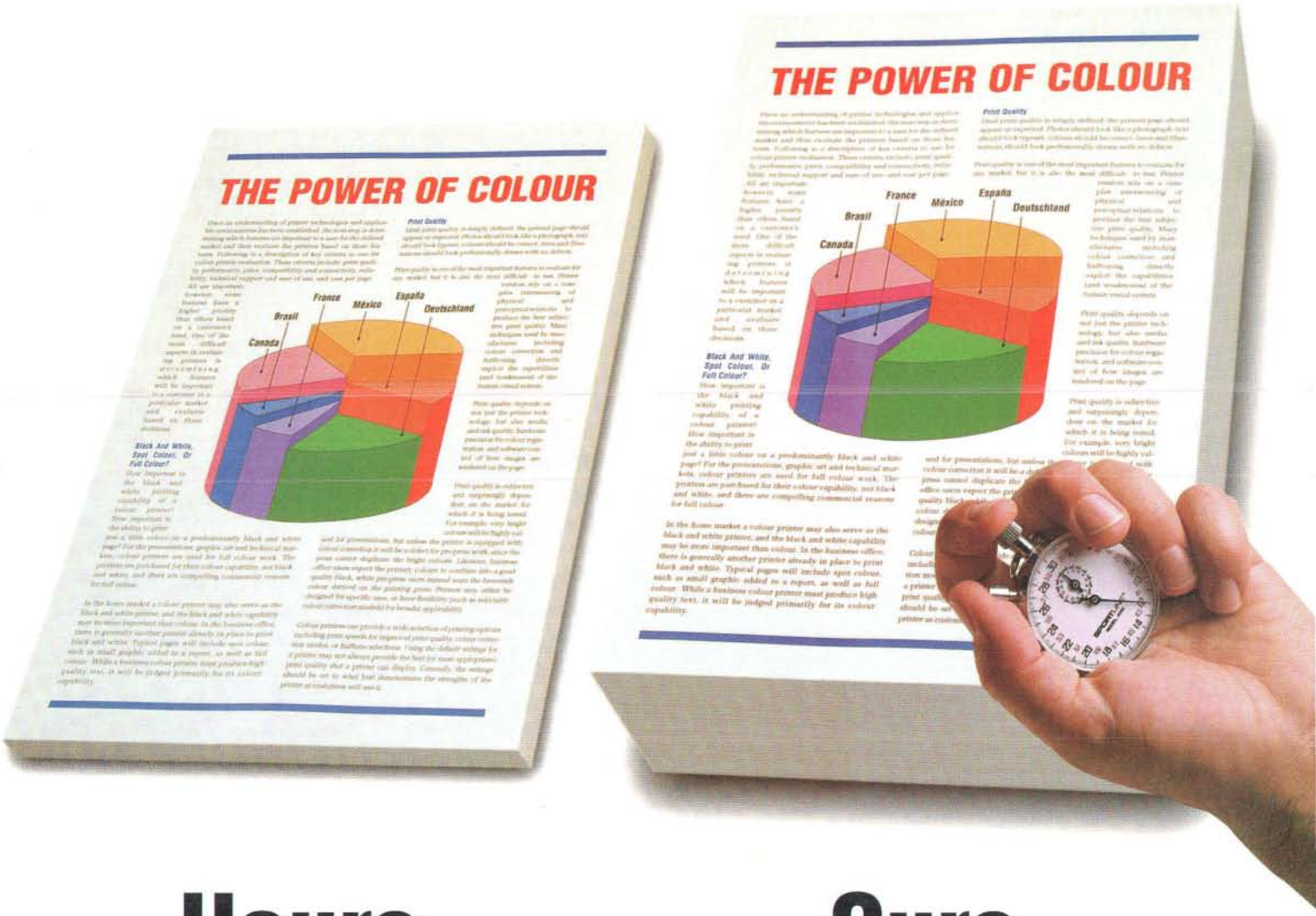
Postcode _____

Type of Macintosh used _____

If you have any problems with your cover CD-ROM please call Macworld Marketing on *0171 831 9252*



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Every printer gives you economy, multi platform capability, full network connectivity and PostScript Level 2. Just choose the one that matches your business needs.

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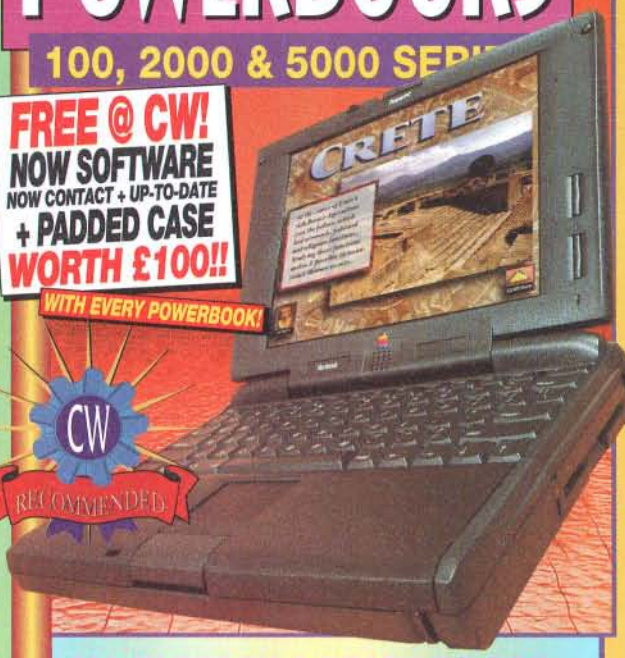

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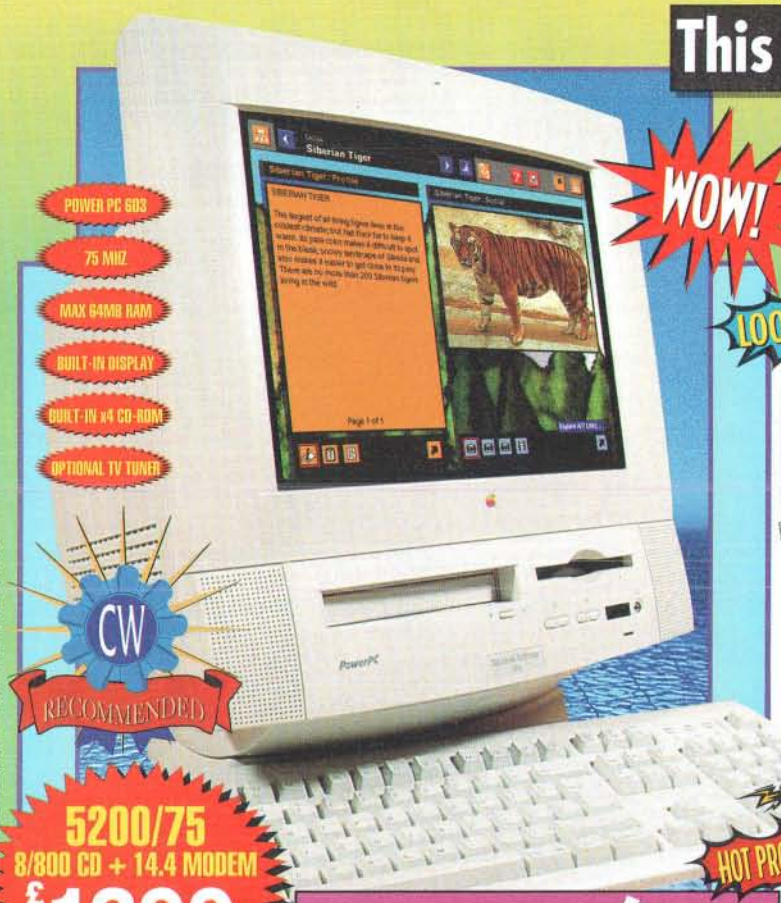

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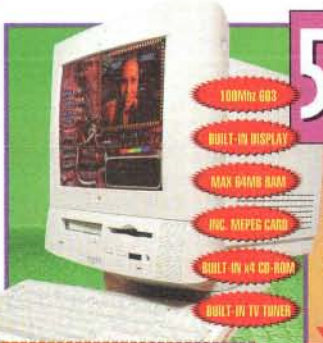

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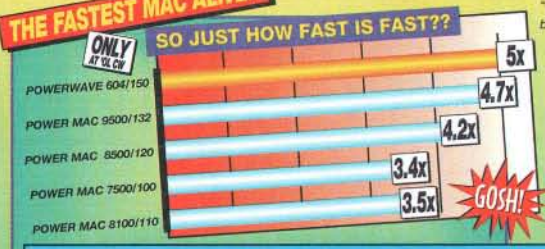

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Mac User 2 Feb 1996

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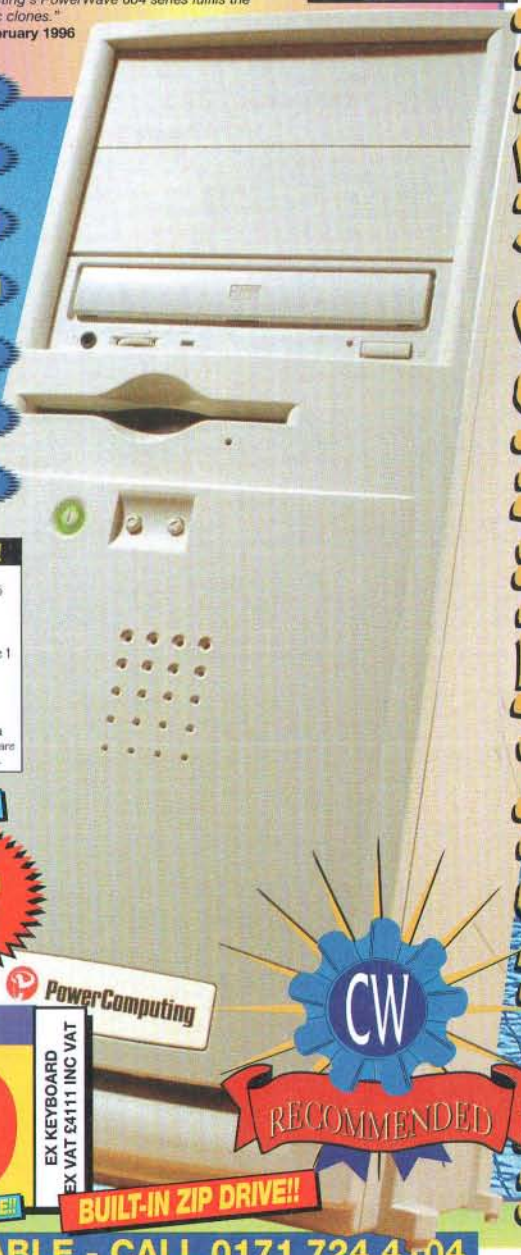
MacUser Labs 5 MICE

MW ★★★★

150MHZ 604 | 512K L2 CACHE | PCI & NUBUS EXP | MAX 512MB RAM | 2MB VRAM | ETHERNET | ZIP DRIVE!



POWER WAVE

150 Mhz 604 PROCESSOR

POWERPC 604

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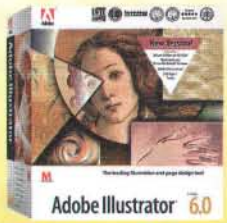

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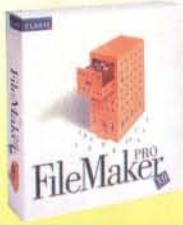

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LaserWriter 16/600 PS	1,649.95
Colour StyleWriter 2200	289.95
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StyleWriter 1200	189.95

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Epson Stylus Pro	449.95
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HP DeskWriter 600	199.95
HP DeskWriter 660c	269.95
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THE MAC ZONE MEMORY PRICE GUIDE

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MessagePad 120 with 2.0 OS	399.95
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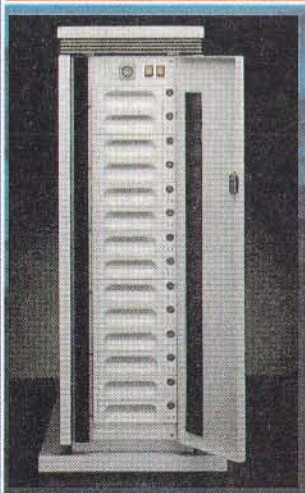

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9GB	FAST	12MS	4MB	£1425
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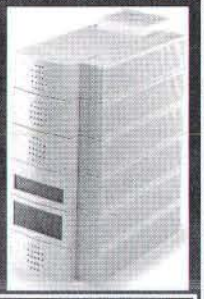

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Power Mac 7200/90 16/1000CD	1647	1765
Power Mac 7500/100 8/500CD	1685	
Power Mac 7500/100 16/1000CD	2109	
Power Mac 8500/120 16/2000CD	3244	
Power Mac 9500/120 16/1000CD + 2Mb ATI Video Card	3242	
Power Mac 9500/132 16/2000CD	3306	
Power Mac 9500/132 16/2000CD + 2Mb ATI Video Card	3497	
Power Mac 9500/132 16/2000CD + 4Mb ATI Video Card	3638	

PERFORMA HARDWARE & BUNDLES

Model	Base Unit	with MultiScan 14" display	with MultiScan 15" display
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6200 8/500 CD Plus II Video-in-TV & keyboard	957	1113	1194
6200 8/800 CD Plus II Modem & keyboard	1009	1179	1263
5200 8/800 CD & keyboard			1152
5200 8/800 CD Plus II & keyboard			1232
5200 8/800 CD Plus II Modem & keyboard			1304
5200 8/800 CD Plus II Modem, Video-in-TV & keyboard			1359
5300 16/2000 CD Plus II Modem, Video-in-TV, MPEG & keyboard			1932

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In adition, modem equipped configurations ship with 'Personal Communications Solution', and TV configurations are supplied with 'Avid Videoshop' and Apple VideoPlayer'.

The Perfoma 5300 MPEG machine also comes with bur MPEG CD titles

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1. This offer applies to qualifying Macintosh Performa models purchased together with an Apple display, keyboard, mouse and pre-loaded software, purchased in the UK between 7/2/96 - 31/3/96. The offer specifically excludes Macintosh Performa CPUs purchased without all of these components. Qualifying models are the Macintosh Performa 630, 5200, 5300, 6200, and 6300.
2. The £50 cheque-back offer only applies to customers that purchase a qualifying Macintosh Performa together with an Apple Personal Communications Kit or Apple TV/Video Kit or Apple StyleWriter 1200 or 2400. The offer specifically excludes accessories that are built-in to selected Macintosh Performa configurations.
3. One cheque for £50 may be claimed per qualifying accessory purchased together with a qualifying Macintosh Performa, up to a limit of £150. Only one claim may be made per qualifying Macintosh Performa system purchased.

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Powerbook 190 8/500	1120		1248
Powerbook 190cs 4/500	1245		1372
Powerbook 190cs 8/500	1452		1580
Powerbook 5300 8/500	1403		1563
Powerbook 5300c 8/500	2338	2657	2468
Powerbook 5300c 16/750	2848	3167	2968
Powerbook 5300cs 8/500	1755	2088	1920
Powerbook 5300cs 16/750	2216	2535	2351
Powerbook 5300ce 32/1100	4336		4500
Powerbook Duo 2300c 8/750	2320		
Powerbook Duo 2300c 20/1100	3026		

Key: GS = Greyscale, PM = Passive Matrix, AM = Active Matrix

Powerbook Duo Mini Dock	239	Powerbook Duo 2300 DuoDock Plus	639
Powerbook PCMCIA Expansion Module	105	Powerbook 190 Infrared Kit	36
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Powerbook 190/5300 AC adaptor	39	Powerbook 190/5300 NiMH Battery	119
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Group 3	Performas, Powerbooks (except 5300), LaserWriter 16/600 Monitors over 16",	15	99	165
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MEMORY

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Powerbook Duo, 150			149	249		
Powerbook 190, 5300				279	505	899
	1Mb	**2Mb**	**4Mb**	**6Mb**	**8Mb**	**16Mb**
Personal Laserwriter 320		82		229		
Laserwriter Select 300/310	65		165			
Laserwriter 16/600			145		260	520
Laserwriter Pro 630			150			
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7200, 7500, 8500, 9500		123	165	309	695	1458
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	15	25	65	120		
Secondary Cache Memory		**256k**	**512k**	**1Mb**		
PowerMac 6100/7100/8100		105	199	385		
PowerMac 7200/7500/8500/9500		95	160	410		

DAYSTAR ACCELERATORS

Turbo040i 20MHz No CoPro	81
Turbo040 33MHz Universal CoPro	199
Powercache 33MHz Univ NoCoPro	89
Powercache 33MHz No CoPro SE/30	107
Powercache 33MHz & CoPro	117
Powercache 33MHz, CoPro SE/30	117
Powercache 40MHz No CoPro	93
Powercache 40MHz No CoPro SE/30	117
Powercache 40MHz & CoPro	129
Powercache 40MHz, CoPro SE/30	129
Powercache 50MHz No CoPro	149
Powercache 50MHz & CoPro SE/30	199
Powercache , Turbo040 Adaptor	29
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Quad040 Accelerator	324
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Performa Video-in-TV card	215
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Pocket Call	65	Tap Works	54
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Newton Enh Pack	90	Time Out Guide	38

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Notepac Grey	26	Leather Notebook	55
Notepac Green	26	Pilot 'NEW'	79

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APPLE			
StyleWriter 1200	165	StyleWriter 2200	256
StyleWriter 2400	274		
EPSON			
Stylus Colour II	249	Stylus Pro A4	385
Stylus Pro XL A3	794	Postscript Upgrade	195
FARGO			
Primera Pro	1299	Pictura 310	3420
Fargo Fotofun	299		
HEWLETT PACKARD			
DeskWriter 320+ASF	155	DeskWriter 600	182
DeskWriter 340+ASF	189	DeskWriter 660C	240
Deskjet 850C	318	DeskJet 1600CM	1219
DeskWriter Colour Kit	28		

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LaserJet 4MV	220	LaserJet 5SiMX	530

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Communicard 28.8 PCMCIA			325
Communicard RJ45 Ethernet + 14.4 PCMCIA			295
Communicard RJ45 Ethernet + 28.8 PCMCIA			405
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Teleport Gold II BABT	145	Teleport Platinum	195
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Powerport Platinum	299	Powerport Gold PCMCIA	132
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MOTOROLA			
3400 Pro V34 28k8	147		
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FaxModem 288	165	FaxModem 144 P/B	135
FaxModem 288 P/B	135	Superhighway 288 net	185
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14k4	80	28k8	125

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- 2400 ppi by interpolation
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GTi 8500	645	GTx 9000	571
GTi 9000	740	Lapcat Scanner	229
Transparency Unit	365	Document Feeder	319
HEWLETT PACKARD			
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MICROTEK			
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Scanmaker II SP	339	Transparency Unit	275
Scanmaker III/Trany	1146	Scanmaker 35t	689
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Photoshop can only be bought with above scanners

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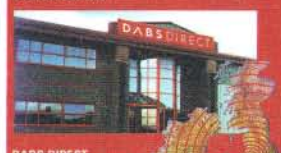

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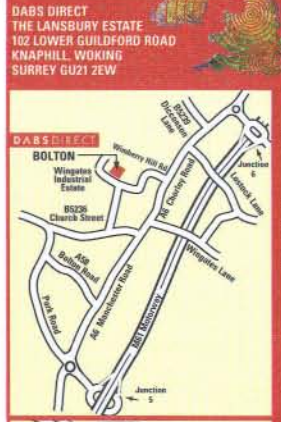

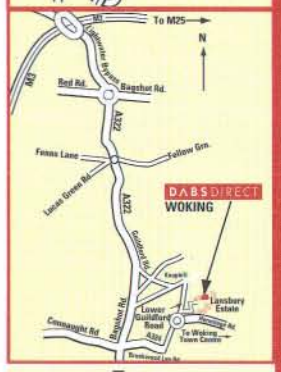

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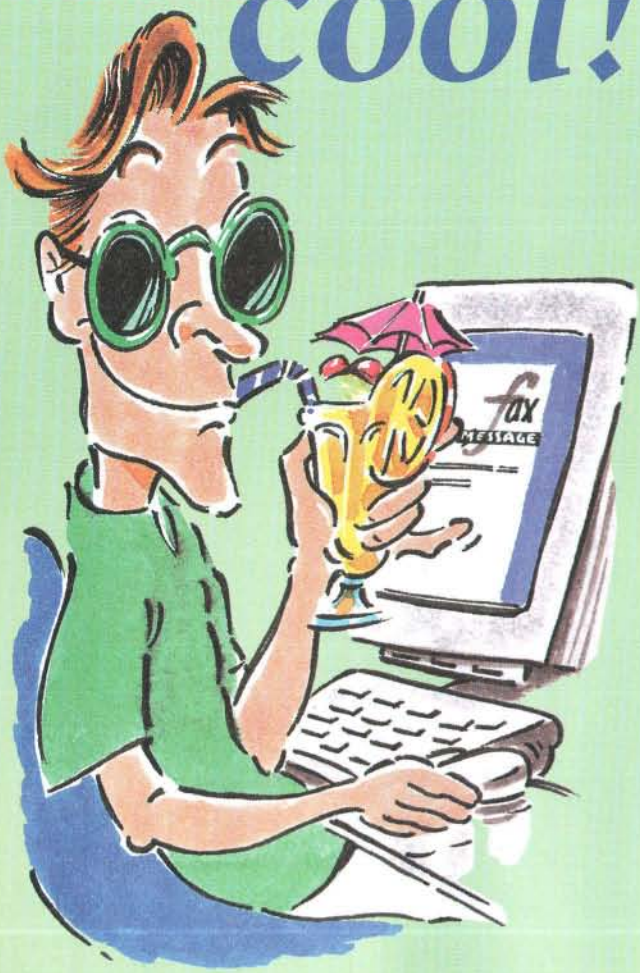

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Editor	Simon Jary	*editor@uk.macworld.com*
Production Editor	Lynn Dartnell	*lynn_dartnell@uk.macworld.com*
Staff Writer	Mary Cowan	*mary_cowan@uk.macworld.com*
Art Director	Mandie Johnson	*mandie_johnson@uk.macworld.com*
Art Assistant	Gerard Locke	*gerard_locke@uk.macworld.com*
Online Editor	Gillian Robertson	*gillian_robertson@uk.macworld.com*
Editorial Assistant	Victoria Nangle	*victoria_nangle@uk.macworld.com*
US Editor	Adrian Mello	
Contributing editors	Steven Levy, Deke McClelland, Steve Roth, Jim Heid, Cary Lu, David Pogue, Lon Poole, Michael Prochak, Ian Winter	
Advertising Manager	Anne Ridyard	*anne_ridyard@uk.macworld.com*
Snr Sales Executives	Ivan Corless	
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Marketing Manager	Karen Williams	*karen_williams@uk.macworld.com*
Subscription Manager	Sarah Bagnall	*sarah_bagnall@uk.macworld.com*
Administrator	Kelly Stemp	
Publisher	Guy Eaton	*guy_eaton@uk.macworld.com*

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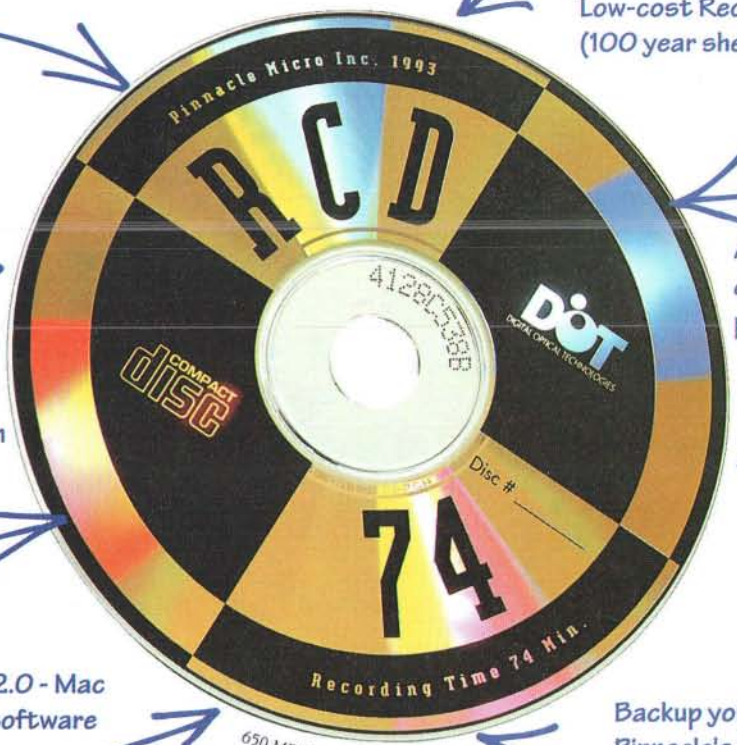

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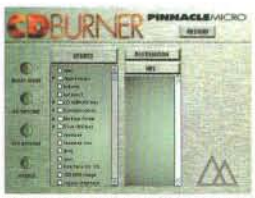

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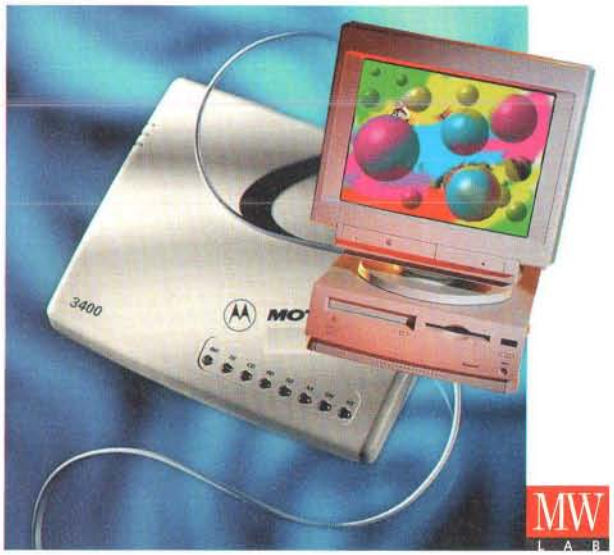
Home office



SoHo, boho... Telecommuting, working from home... It all sounds very relaxing. No more squeezing onto the tube, pushing past prams on buses, staring into armpits on the train. But is the home office all it is cracked up to be? Or is the company's office the natural place to suck your biro in? Are you watching your Mac screen or Richard and Judy when 'busy' at work *chez you*?

***Macworld* takes at a long hard look at the home office next month. So, you've decided to take the plunge... and stay at home. Our experts pinpoint the highs and lows of home work – and choose the perfect tools for your domestic Macintosh workplace.**

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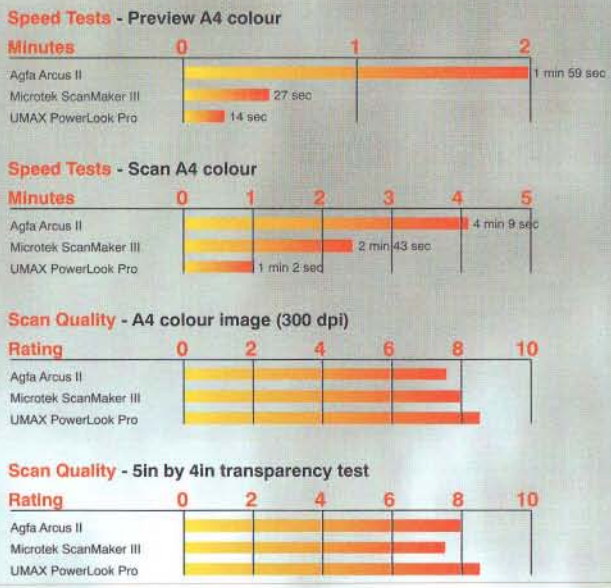
What is it that makes UMAX scanners so popular? Take a look at the MacUser Labs results below (Vol 10 No 19) on the best-selling PowerLook Pro and see for yourself...



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Will Quark sink

DTP giant jitters as delays plague XPosure... but Immedia should ship in the midyear

Not content with QuarkXPress's secure position at the top of the page-layout heap, Quark (01483 451 818) decided to broaden its scope by branching into multimedia with the QuarkImmedia XTension (previously known by the code name Orion) and into image editing with QuarkXPosure (see News, May 1995), brazenly entering Adobe/Macromedia territory. Although both products were scheduled to ship by summer 1995, neither has arrived.

Do the delays reflect trouble at Quark, or a series of unrelated coincidences? Sources close to Quark allege that shifting priorities, high turnover (for example, only one product manager at Quark has held the position for more than two years), and low morale are hurting the company's efforts.

Quark's president, Fred Ebrahimi, disagrees; he claims a record profit in 1995 and a 25 per cent increase in worldwide XPress sales, as well as low turnover in research, programming, and product management. He also cites a new commitment to improved customer support. Sources paint a darker picture of a Quark stressed by inconsistent management and shifting priorities.

XPosure: *grim prognosis* Groomed by Quark as a Photoshop killer and first shown in prototype form over a year ago, QuarkXPosure generated much excitement among artists and publishers.

But XPosure has yet to ship, or even go into beta testing. A joint project between Quark and JVC, a Japanese company that has not previously brought a Macintosh product to market, XPosure faces serious technical problems, says Ebrahimi, who admitted that "it's not in a condition I would consider shipping." While hoping for a solution, Ebrahimi says, "We didn't do the R&D work. We have no control over the [core] technology."

He said Quark will decide "in the next few months" if QuarkXPosure can be fixed to

Apple slashes Mac prices again but shelves speed increases

As part of its corporate belt-tightening exercise in the face of increased second-quarter losses, Apple has cancelled the PowerSurge2's – the revised Power Macintosh 7200, 7500, 8500, and 9500 versions that were to ship this autumn with Firewire (the very fast serial connection also called 1394, profiled from page 42). Instead Apple is concentrating on the PowerPC Platform (formerly known as CHRP). Read our PPCP investigation on page 30.

Firewire will be available on the PowerPC Platform-based Macs through an add-on PCI board. Apple had no official comment on any internal project cuts or product plans.

On the plus side, Apple has announced price cuts on its latest range of Power Macs, which should save you having to tighten your own belt. Effective immediately, the price changes mean that you can buy a low-end Power Mac 7200 for under £920, or the bundled Power Mac 7200/75 (8MB RAM, 500MB hard disk) with the Apple Multiscan 1705 display (no keyboard) for approximately £1,390. For further information call Apple on 0800 127 753.

PRODUCT	SPECS	NEW PRICE	OLD PRICE	PRODUCT	SPECS	NEW PRICE	OLD PRICE
Power Mac 7200/75MHz	8/500	£920	£1,005	Power Mac 7500/100MHz	16/1GB/CD	£2,120	£2,299
Power Mac 7200/90MHz	8/500/CD	£1,190	£1,360	Power Mac 8500	16/2GB/CD	£3,240	£3,540
Power Mac 7200/90MHz	6/1GB/CD	£1,510	£1,790	Power Mac 9500/132	16/2GB/CD	£3,665	no change
Power Mac 7500/100MHz	8/500/CD	£1,800	£1,825	Power Mac 9500/132	16/2GB/CD	£3,520	£3,880

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Think memory.

or swim?

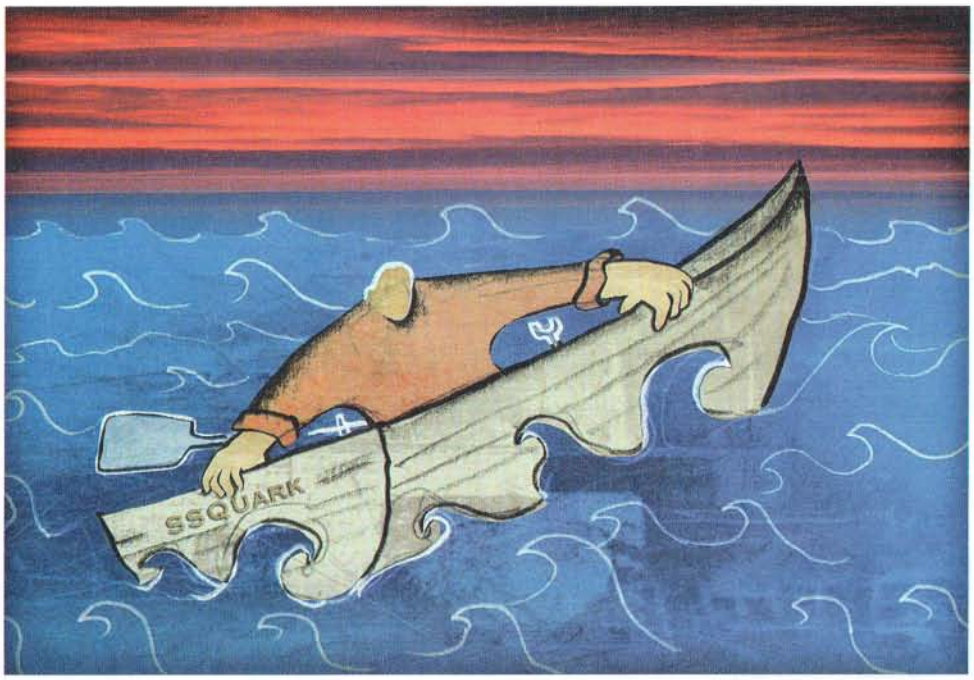
the company's satisfaction and that the product has "about a 50-50 chance" of survival.

The picture actually looks much bleaker, according to knowledgeable sources who say that conflicts between the two companies over JVC's refusal to correct serious performance and interface problems have effectively derailed the project. (JVC would not comment.)

As a result, Quark's XPosure design team has been reduced to a skeleton crew, these sources say. Ebrahimi would not comment on staffing.

Sources say that an agreement letting Quark use PixelCraft's colour-separation architecture in XPosure also fell through late last year.

Neither Quark nor PixelCraft would comment on this allegation.



JOHN RITTER

Immedia: *should ship this year* Quark's multimedia XTension, Immedia, is in much better shape. The company says Immedia will be out by summer; beta testing was expected to have begun by the time you read this.

Immedia is taking a different approach to multimedia publishing than programs like Adobe's PageMill, eschewing Internet standards such as HTML in favour of Quark's own browser, which would work as a standalone viewer or as a plug-in for Web browsers like Netscape Navigator.

Ebrahimi says QuarkImmedia is designed to deliver documents that have layout, typography, video, and sound, and that HTML and other Web-publishing technologies simply can't produce such design-oriented documents.

XPress: *not top priority* The status of XPress 4.0 is less clear. Last spring, Quark chairman Tim Gill described an initial features list at the QuarkXPress Conference and said that 4.0 would ship toward the end of 1995 (see News, August 1995).

Long-document producers looked forward to XPress 4.0's indexing, table-of-contents generation, and multidocument production. Networkers dreamed of refined workgroup usage. Table creators longed for an unlimited number of tabs. And subs pined for character-based style sheets. Don't hold your breath, folks...

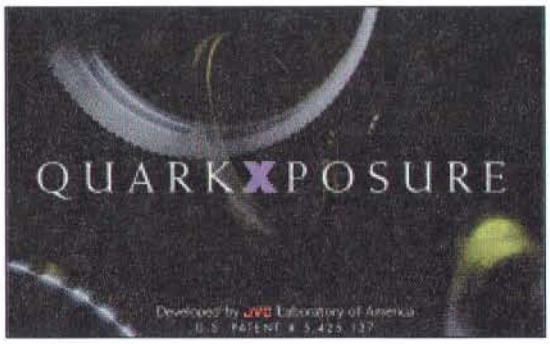
Ebrahimi says Quark has no schedule for XPress 4.0. He would like it to ship this year, but "it's fine with us if it ships next year." That's because the priority project at Quark right now is Immedia, which he believes will broaden Quark's business.

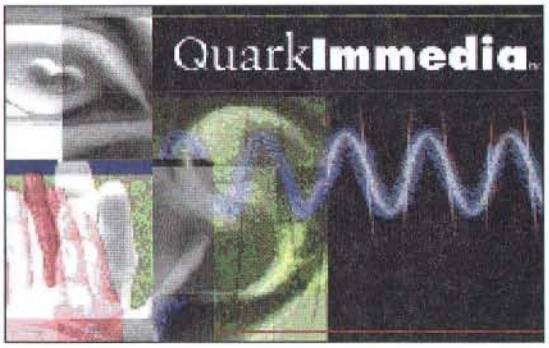
A future assured?

Quark clearly feels its superior technology will maintain its edge over competitors in the long haul.

But can a one-product company turn into a successful multiproduct entity, given Quark's reputation for being difficult and its dependence on one man – Gill – as the visionary and primary architect of its key technologies?

E-mail Macworld *to tell us what you'd like to see from Quark, and we'll publish the results next issue.*





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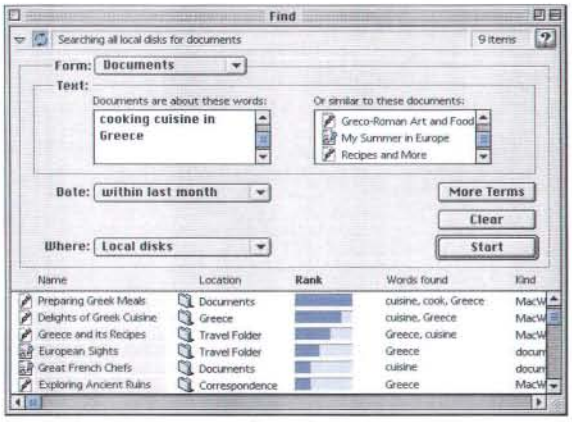
Core! Copland

'Internet-friendly' System 8 organizes files by content, but some features are put on ice

Apple has long promised that the Mac will be an active assistant, helping you wade through your data and make sense of it, not just serving as a repository for it. The next major release of the Mac Operating System, code-named Copland and due out in late 1996 or early 1997, will move the Mac a larger step in that direction.

And David Nagel, senior vice president of research and development, has indicated that Copland will be the first "Internet-friendly OS", with Apple's CyberDog Internet interface directly integrated into what will eventually be released as System 8.

With Cyberdog, users will be able to browse the Internet from within any OpenDoc application; drag-and-drop World Wide Web site addresses and links into applications; have a cross-platform, Internet-based mail application; and add functions – such as videoconferencing support – to virtually any application using the OS.



The Copland OS will let you find and organize your data by its content.

Here are some of the other new capabilities you can expect in Copland.

View by content A new technology tentatively called a *view window* lets you organize information based on your criteria. You enter words you want Copland to find in documents, and it then creates a window that contains all documents with the words, along with a ranking of how closely the document fits your search request. This feature also lets you select a document and have the Mac OS find documents with similar content – no need for you to enter the search text.

You can save any view window and have it automatically update with any new or changed documents the next time you open it, thanks to Copland's multithreaded design that allows powerful background processing.

Interface refinements Copland will have refinements to the user interface throughout. A significant change features a subtle change to the Finder's file-view capabilities. Now, when a file name is too long to fit in the list view (view by name), the Finder just displays the first part of the name. If you have a long document name that ends with significant information, such as a revision number or date, you can't see that information. But Copland's Finder shows part of the beginning of the file name and part of the end, so you have enough context to readily tell files apart.

Restructured System Folder Apple also plans to restructure the System Folder so that you can tell which extensions the system needs and how recent they are. Apple's product-marketing director for Copland, Vito Salvaggio, concedes that today's System Folder is a confusing morass of files, extensions, and preferences that makes system management and troubleshooting difficult. However, he notes that this restructuring may not make it into the first version of Copland. For Apple to meet its end-of-1996 release date, the company may have to pull some features and deliver them in 1997 as an upgrade.

Cuts in Copland Cost containment at Apple – following first quarter losses and anticipating an even worse second quarter – will undoubtedly affect Copland, as the company cannot afford to delay its release any further. The company that made a habit of blindly throwing cash at projects has spent the last nine months ridding itself of projects that were sucking up resources without results. And according to sources (both within and outside Apple), even core technology groups are being forced to make compromises.

For Copland, such compromises take the shape of dropped features. Every company that develops software must jettison projects and features on a continual basis. But Apple's recent troubles throw these cuts into sharp relief.

The Copland file system will be written in native PowerPC code, unlike System 7.5 – but early reports say that users will not notice any significant speed improvement as a result of the new file-system code. And Apple has killed a new disk-directory structure. Today's 2GB hard drives store small files inefficiently because the minimum block size – the smallest storage unit – is 32K, even if the file is only 10 bytes long. The cancelled feature would have added additional b-tree structures in the disk directory to support much smaller minimum block sizes on large drives. Apple also killed native support for the Windows NT file system.

Custom configurations Previously announced Copland features include the ability to set up multiple users on one system, each with different preferences and access capabilities. For example, a notebook user might have one group of settings on the road, when server access is unnecessary, and a different group when plugged into the office network.

You can sort of do this now by using System 7.5's Extensions Manager to save different extension and control-panel settings, but that requires a restart. Under Copland, switching user settings requires only a partial restart, which takes much less time. – **Galen Gruman, Tom Quinlan and Cary Lu**

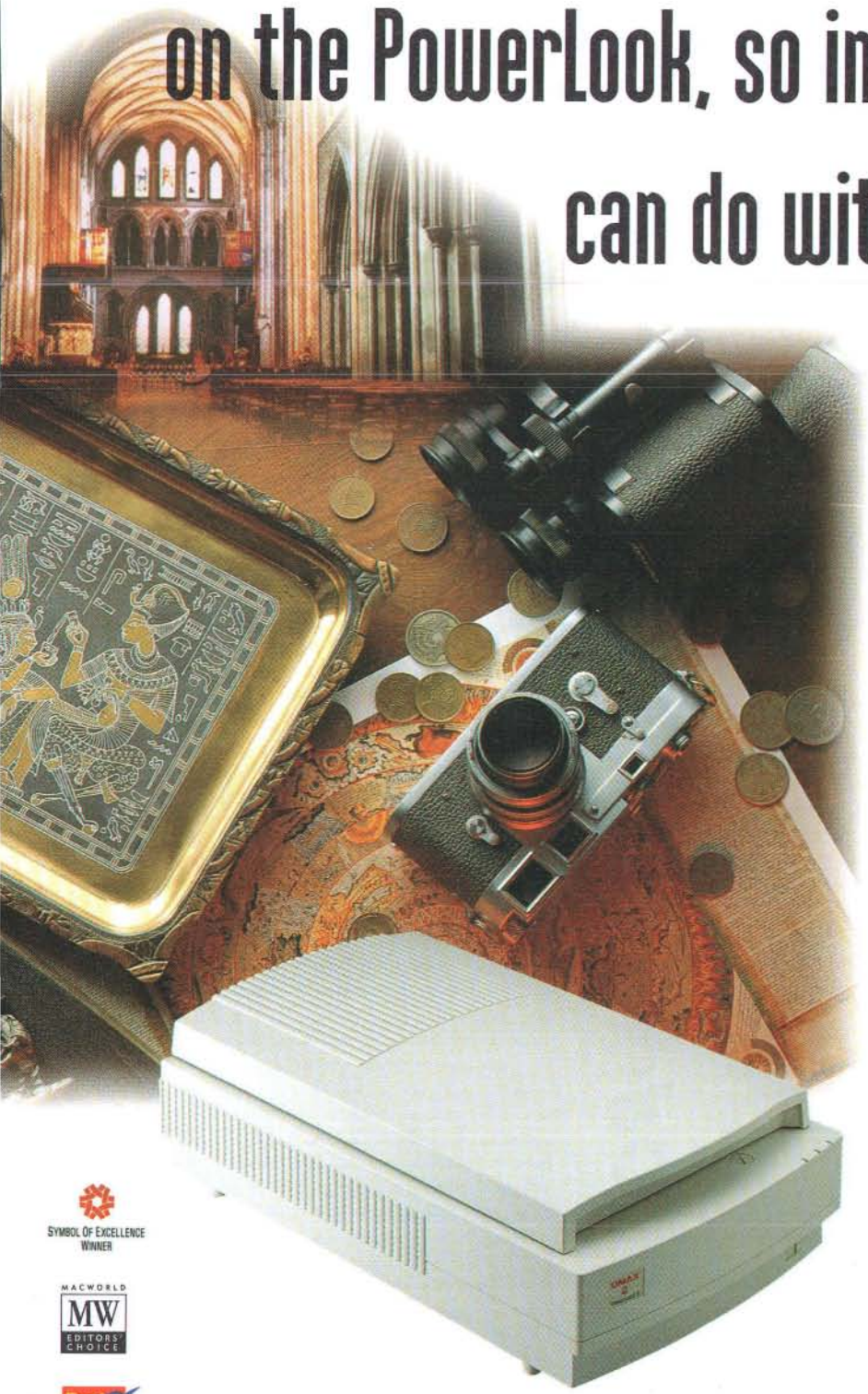
HTML fonts

Adobe, Apple, and Netscape have announced that they will work jointly to provide cross-platform font technology for HTML and PDF documents.

The companies will define HTML extensions for Adobe Type 1 and Apple TrueType fonts to ensure that Web pages are viewed as originally intended.

Adobe Acrobat's Amber plug-in for Netscape will support the new technology. The companies expect the proposed extensions to be finalized by the end of the year.

You can already scan images of this quality on the PowerLook, so imagine what you can do with PowerLook II



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UMAX

Apple lands first clone partner

Motorola deal to kickstart wobbly PowerPC Platform as Apple finally loosens grip on Macintosh hardware

300MHz 604 chip soon

Motorola said that next year it will release a 300MHz version of its PowerPC 604 processor. Its 64-bit processor, the PowerPC 620, will be available for production in the middle of 1996.

Within two weeks of his appointment as new CEO and chairman of Apple Computer Gil Amelio signed a breakthrough licensing deal with Motorola Computer Group, which looks set to kick-start Apple's flagging Mac OS-licensing programme.

Along with Apple and IBM, Motorola developed both the PowerPC chip family and the forthcoming PowerPC Platform (PPCP, previously known as the Common Hardware Reference Platform), an industry-standard hardware design that will the form the basis of the Mac platform beginning late this year or early in 1997.

The licensing agreement applies to version 7.5.x of the Mac OS and includes access to the next major release (System 8, codenamed Copland – see page 28), with no restrictions with regard to markets, models, or geographic regions, according to Apple and Motorola.

But it doesn't end there. Motorola also becomes the first licensee to be able to sub-license the Mac OS with its motherboards to OEMs, who could then differentiate their products without specific permission from Apple – the classic PC-clone model.

Motorola's arrangement represents the beginning of a broad licensing program based on the PPCP, said Amelio: "This agreement is a major milestone in our licensing program. We believe that Motorola, a key player in this industry, has the resources and technical strengths, especially in the communication area, to help enrich the Mac platform."

"This licensing agreement is strong evidence that Motorola is committed to PowerPC and the Mac OS market," said Joe Guglielmi, corporate vice president and general manager of Motorola.

Apple's original OS licensing strategy, announced in late 1994, was also based on the idea of open, broad licensing. But the company shifted gears – fearful of competitive pressures that could erode its bottom line, and daunted by the logistical difficulties of supporting licensees on today's proprietary Mac hardware design.

Competitive stance

By licensing the Mac OS now, Motorola hopes to get a jump on as yet unknown competitors selling the Mac OS, but would not announce any timelines for product releases. Guglielmi indicated, however, that his company would not ship any PPCP systems until all the OSs supported by the platform, including the Mac OS, Solaris, and Windows NT, were up and running reliably.

Guglielmi said that Motorola will emphasize "best-of-class" systems and motherboards for its Mac OS-based offerings, a posture that would seem to place it in direct competition with Apple, which recently

Can PowerPC maintain momentum?

IBM's recent decision not to produce a commercial version of OS/2 for desktop PowerPC systems has left Apple's Mac OS virtually alone for now to carry the PowerPC flag on the desktop. But now that Apple has licensed its Mac OS to Motorola, which is already a partner in the PowerPC initiative, the Mac OS will have other vendors' support besides just Apple's. Microsoft's Windows NT, which also runs on the PowerPC, is expected to dent the market sometime this year.

Nevertheless, IBM's decision is seen as a loss for the PowerPC. IBM officials maintained that the company remains committed to the PowerPC in its RS/6000 and AS/400 product lines, but some observers questioned whether the overall PowerPC initiative can gain momentum as a mass-market alternative to the Intel juggernaut. This also has raised fears that potential systems makers and independent software vendors might be scared away from the platform.

"The PowerPC is doomed to failure if Apple is selling 95 per cent of the systems," predicted Kimball Brown, an analyst at market research firm Dataquest.

But PowerPC proponents said that as Motorola starts to sub-license the Mac OS, it is only a matter of time before other vendors begin to deliver systems based on PPCP. That platform supports multiple operating systems, including Sun's Solaris, Novell's NetWare, IBM's AIX and Windows NT.

An even bigger boost for the PowerPC platform may come from NT, users and analysts said: "NT is a very viable possibility for the PowerPC," said Pieter Hartsook, editor of industry newsletter *The Hartsook Letter*. "If a core of vendors [such as] Compaq, Gateway and HP put muscle behind it, that could be very significant," Hartsook said. – **Lisa Picarille and Jaikumar Vijayan**

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major Mac OS

GERARD LOCKE

announced a similar strategy. He indicated that Motorola will primarily target the enterprise market, historically a weak spot for Apple: "We're almost exclusively focused on the enterprise, and we have no plans to put Motorola-branded products into the retail channel," he said. He added that Mac-based laptops will not be among the initial offerings.

Java computer on the way, too

Motorola also has plans to build a PowerPC processor specifically designed to run Internet-based applications written in Sun Microsystems' Java programming language: "We've started activities with Java, but it's still in the definition stage," said Hans Wildenberg, a director of Motorola Semiconductors.

Over the next two to three years, the consumer market will be asking for a low-priced Internet computer (or *network computer*). Because the PowerPC can achieve high performance levels while maintaining a small die size, Wildenberg said, it would be well-suited for such a machine. The company is considering building a version of the chip to power a scaled down type of computer that might not even include a keyboard or screen, he said. See Atmark story, page 33.

Regardless of whether Motorola's Java plans are imminent or not, the company said that it has chosen Sun's technology for its Internet strategy: "The next step in the industry is away from Wintel and into the Internet; we believe that Java today is probably the best-positioned programming language" for the Internet, Wildenberg said.

Apple's move to PPCP

Apple also announced a new twist on its move to the PPCP. "Over time we will move a large fraction of our systems over to PowerPC Platform-based systems," said Apple Senior Vice President David Nagel.

But some models, such as those built for the education market, may remain with the current Mac hardware platform indefinitely, he added. Previously, Apple had indicated that all Mac models would be moved to the PPCP. In a move that further indicates a more open approach on OS licensing, Lamar Potts, Apple's vice president for licensing, said that once the PPCP is in place, a customer could buy a shrink-wrapped Mac OS for any PPCP-based computer, even if the machine's manufacturer did not have a Mac OS license.

If the system was genuinely PPCP compliant, the Mac OS would operate normally. **– Charles Piller, Cara Cunningham and Mary Cowan**

Gil Amelio's vision of tomorrow's Apple – see page 36

3D standards

The idea of a unified standard for 3D graphics on the Internet took a beating with the leading developers of the Virtual Reality Modelling Language (VRML) 2.0 standard starting to jockey for position at each other's expense.

A rift in the development community became obvious when Silicon Graphics and Netscape launched a pre-emptive strike for their Moving Worlds 3D technology, claiming that it is now the VRML 2.0 specification.

Microsoft immediately disputed that claim and vowed to go ahead with its Active VRML specification, which beta testing early this year.

Sun Microsystems and Apple, with their own Holo Web and Out of This World proposals, also declined to support SGI's bid.

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Big guns drawn for June's Mac OK Corel

PC graphics giant Corel has finally made the jump and entered the professional Macintosh market. Mac artists, long-accustomed to deciding between Adobe Illustrator (see review of version 6.0, page) and Macromedia FreeHand, can now look forward to the introduction of PC-leader CorelDraw.

Media Relations and Market Development manager Eric Lefebvre told Macworld that CorelDraw for the Mac will ship in June. The Macintosh version will have a much-transformed look-and-feel to the Windows version, but will not skimp on features and toolsets.

After paying Novell $115 million for the WordPerfect applications group, Corel's CEO Michael Cowpland had hinted that there would be increased efforts to bring Corel's other products into the Mac space.

PC-market graphics leader in summer battle with Illustrator and FreeHand

And now it has been confirmed that the Canadian-based software publisher will be porting a Mac version of Draw, entering into the bloody battle for the high-end graphics market with Macromedia and Adobe.

Right time

Corel officials said that its graphics professionals had been asking for a Mac version of Draw for some time. The company felt that with new 32-bit platforms now was the right time to bring CorelDraw over to the Mac platform.

Carrie Bendzsa, media relations co-ordinator for Corel said that the Mac version will be made up of seven components.

- *For illustration*: CorelDraw 6.0
- *For modelling and ray tracing*: CorelDream 3D
- *For image editing*: as-yet unnamed painting package
- *For bit-map-to-vector conversion*: CorelTrace 6
- *For cataloguing*: Corel Multimedia Manager
- *For font- and file-management*: Master Juggler
- and, a texture program

Corel is clearly hoping to cash in on its PC installed base. A recent IDC study revealed that in 1995 CorelDraw 5 and 6 captured 67.5 per cent of unit sales for graphics software.

Bendzsa said that Corel was working on having many Mac-specific features. These will include a redesign of all the programs' interfaces. with added printing and pre-press capabilities, Apple Guide, and support for ColorSync 2.0 profiles and QuickDraw GX.

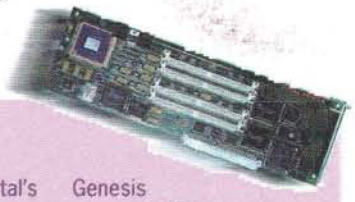
Corel says the texture program – a specific Mac component – lets users create natural-media textures, render textures as PICT or TIFF images, and apply bevel effects and embossing to bitmaps.

Bendzsa added that the suite will also include clip-art images, TrueType and PostScript Type 1 fonts, and approximately 1,000 high-resolution photos.

CorelDraw for the Mac will require System 7.5 or higher and a minimum of 8MB of memory. CorelDraw is scheduled to start shipping in June, but pricing has not been set. It is expected that the Mac version will be available through Corel's regular distributors.

WordPerfect hopes raised

At a press conference at the time of the merger, Corel CEO Michael Cowpland was positive but unspecific about Corel's plans for the WordPerfect applications on the Macintosh. But the future of the Mac version of WordPerfect looks rosier with the decision to port CorelDraw over to the Apple platform, despite the defection of three WordPerfect for Mac engineers to World Software, publishers of word-processing program WorldWrite 3.0.



Total PCI Power

Total Impact (**http://www.totalimpact.com**) has announced the Total PowerSMP and Total FreedomSMP, PCI-based multi-processor application accelerators. The Total PowerSMP system is equipped with one, two, or four PowerPC 604 CPUs operating at 100, 120, 133, or 150MHz. The board also features 512K of external cache and up to 1GB of upgradable RAM.

The Total Power accelerators follow the multiprocessing lead of DayStar Digital's Genesis systems – see page 34. Built-in library extensions let users of Genesis MP-capable applications access the Total PowerSMP accelerator boards without any software modification.

Single-processor systems start at £1,283, two-processor systems start at £1,810, and four-processor systems start at £2,941.

RenderMation, 0181 341 5484

CyberDog unleashed

Apple's Simple Text of Internet Access

At first, CyberDog was just a technology demonstration – a shill for the grand OpenDoc show. But now the Dog's star is rising fast as Apple looks for a peg from which to hang communications services in the Mac OS.

Previewing the first beta version of CyberDog, recently posted online by Apple left me with conflicting feelings. Is CyberDog just another Internet access tool or is it the opening salvo in an OpenDoc-led software revolution?

Unlike any other Internet access software, CyberDog revolves around the Notebook, a list of your Net resources: URLs for Web pages, FTP and Gopher sites, names of newsgroups, and e-mail addresses. Double-clicking on a Notebook entry automatically fires up the appropriate browsing tool, or you can drag an entry and drop it on a browser window. You can group Notebook entries under simple header items called *Categories*, although you only get one layer of hierarchy – a problem that Apple says it will fix.

The Notebook is not without its warts: renaming an item requires that you dive into a menu, and there's currently no easy way to import large quantities of bookmarks from another browser.

The CyberDog Web browser is a model of simplicity peppered with some nifty features. The Log, for instance, holds a record of every site you've ever visited, and you can sort it chronologically, alphabetically, or hierarchically; this last groups all the pages from a single site together in a rough, relational hierarchy. The Web browser supports a tolerably advanced set of HTML tags (all of the 2.0 specification, plus tables and background pictures); not surprisingly, there's no support for either Java or Shockwave. FTP and Gopher browsing brings up window similar to the Web browser, but rather than an HTML click-and-go metaphor, CyberDog transforms Unix directories into Finder-style folder hierarchies.

CyberDog's newsreader handles its duties with a minimum of fuss and sports several civilized features, including *News Handlers*, with which users can filter unwanted posts out of their news by author and subject.

The e-mail component is CyberDog's weakest link, simply because of its lack of robust address-book features. You can store addresses in the Notebook and send messages to multiple recipients by shift-selecting your intended targets, but there is no way to make address groups short of creating multiple instances of single addresses. This could be easily solved by adding the ability to make aliases of Notebook entries: pointers that could then be organized as you chose, a direction that Netscape is taking with version 2.0 of Navigator.

The current incarnation of CyberDog feels like nothing so much as the SimpleText of Internet browsers. Each component does its job neatly and quietly, and if it's not as expansively tricked-out as other tools, neither is it nearly as complex or unwieldy.

CyberDog's component interfaces need some serious time on the buffing wheel, and Apple must come up with both Java support and a generic component that accepts Navigator plug-ins. But even given the usual hitches and gasps of code in process, CyberDog's component software underpinnings and central Notebook metaphor make it a tool with seductive promise.

– Cameron Crotty

Seconds out for next generation Genesis Mac

DayStar Digital is forging ahead with Power Mac clone plans for a second-generation Genesis multiprocessor system. The Genesis MP 600 incorporates four 150-MHz 604 PowerPC chips, and a "pseudo" symmetric multiprocessing design for improving DTP applications.

Genesis 600: DayStar's super powerful 150MHz PowerPC-604 multiprocessing Macintosh

In addition to the faster processors, the Genesis MP 600 series features six PCI slots, a quad-speed CD-ROM drive, and built-in ethernet connectivity. At the entry level, the system comes with 32MB of memory and a single 2GB SCSI-2 hard drive. It is expected to cost around £16,000. A system with 64MB of memory, a 1GB SCSI-2 drive, a 4GB SCSI-3 drive, and a graphics accelerator card capable of supporting a maximum resolution of 1,600-x-1,200 pixels is priced at approximately £20,000.

Both systems, like the Genesis 100- and 120-MHz 528 series (starting at £11,999) introduced last year, use the Multiprocessor API extension for the MacOS that was jointly developed by Apple and DayStar. The API lets compliant applications divide tasks between the four processors. Companies that have or plan to introduce applications and tools supporting the Genesis architecture include Adobe, Metrowerks, Strata, Macromedia, and Truevision. *Computers Unlimited, 0181 200 8282*

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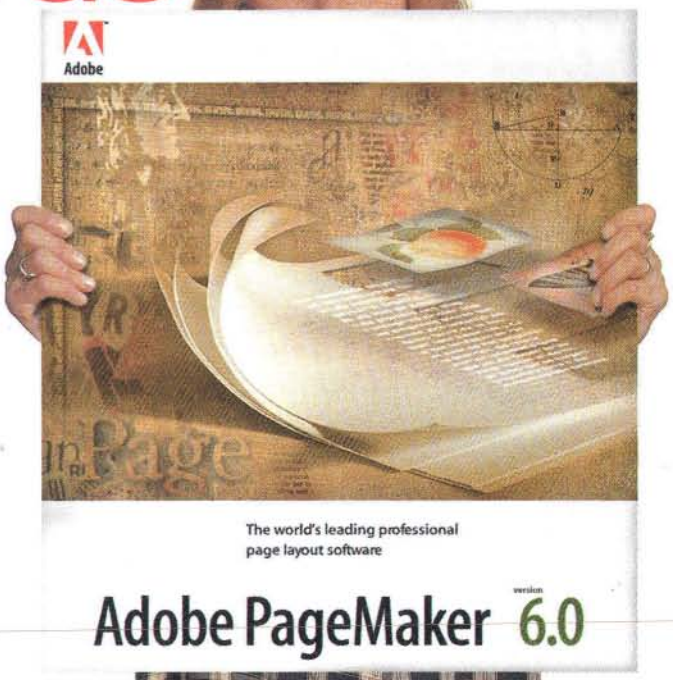

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Apple futures from

Marco Landi – talks openly to *Macworld*.

The big cheeses at Apple share their personal visions with *Macworld*.

On this page Marco Landi talks to Mary Cowan. And, on the right, new CEO and chairman Gil Amelio opens his corporate heart on a trip to Macworld Japan.

Overflowing with Latin-passion Apple's European president Marco Landi revealed his vision for Europe operations to *Macworld*.

"Apple has made three major mistakes. One we had no licensing, which has been catastrophic. Two, we had bad marketing. And three, we had very poor communication."

Landi clarified Apple's new strategy simply: segment, focus and provide solutions.

"Apple lost against Windows – not because of technology, our product is far superior, but we lost in marketing.

"This computer industry is not monolithic, and you can't be everything to everybody. You can't do everything for everybody, or do everything yourself. And this is a change of mentality and attitude that we have to adopt."

"Within this industry it's evident that there are three major domains. There is the computing space, and within this there are two major shifts from the mainframe to the client server, and a shift from the desktop publishing to the multimedia publishing. There is the communication space, where you have people on the move, people who need to have their office with them. The third major domain/space is edutainment, which includes the home, the family, education and the small business.

"Last year we were selling the same product across these markets. With no differentiation, no verticalisation, no clear differentiation of what the customer needed, so what we are trying to do now is acknowledge that."

Landi believes that by segmenting the computing market, focusing on the key areas of interactive publishing, family-oriented software and the European education market, always providing the best solutions Apple will "be the number one".

"We have decided we want to be the best. We want to make sure we will be a major player in the education market, even though it is relatively small in Europe.

I need to focus on those areas where I know we can be the number one, namely the multimedia publishing, family and education markets. These are the areas where there is most growth."

Actions speak loudest

When describing how to provide the best solutions for the target markets an excited Landi said, "In the last two weeks we've announced Acorn, Disney, Digital Village, and EMI."

Disney Interactive and Apple plan to cater to the family with the Apple Disney collection of interactive CD-ROMs for Apple's Performa line of home computers. The first collection will be available in localized versions in the UK, France, Germany, Benelux and Italy in the second quarter.

Apple wants to be "Internet-centric" in its push for market share, Landi said. Two of the new marketing deals announced here include online services.

Digital Village, a newly formed UK company, is to use technology provided by Apple to create content for the Internet, CD-ROM and television. No financial details of the deal were available.

And beginning in March, all Power Macs will be bundled with Adobe's PageMill, the easy-to-use program celebrated as the PageMaker of Web-page makeup. Adobe Site Mill, a site-management tool, will also be offered as an option, according to company officials.

Apple Computer Europe, 0033 1 69 86 33 94.

Gil hires pal

Apple has confirmed that Gilbert Amelio, Chairman and CEO of Apple Computer, has made his first hiring decision, recruiting George Scalise to be Chief Administrative Officer of Apple.

Scalise had served under Amelio as various positions for just under five years while the two were at National Semiconductor.

Given Scalise's record in the semiconductor industry, he may also provide the company with some much-needed negotiating talent as Apple continues to try and collect allies in the battle to create a Mac clone market.

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on high

Dr Gil Amelio – wants a chat with *you*.

Just over two weeks after taking office as Chairman and CEO of Apple Computer, Gil Amelio travelled to Japan where he met with customers and press, as well as making a surprise appearance at Macworld Tokyo. Over the two days he was in town, both on stage and in one-on-one conversations, Amelio revealed several hints about his plans for reviving Apple and difficulties he thinks the company faces.

On the biggest challenge facing Apple: "There is only one problem that I am really concerned about and that is, there has been much written about what's going on at Apple and a number of our customers have gotten very concerned. And to the extent that our customers hesitate buying that next machine or upgrading product they have – that worries me.

"I would say that the biggest challenge that we face right now is getting consumer confidence back again; getting people a little more comfortable that Apple is going to be around for a long time to come."

On the first actions he will take: "First and foremost we are going to deal with the financial challenges of the company quickly. We will have to do some housecleaning... We'll have to recognize where we have obsolete inventory; where we have structure that we no longer need and needs to be modified and generally we'll deal with that very very quickly.

"It will cause a loss for this quarter, a significant loss more than likely, but that I don't view as the fundamental issue. The issue is – get the problem solved and behind us... and at the same time set up the financial structure that will allow us to be successful as we go forward."

Profitable priorities

On the source of Apple's current excess inventory: "The difficulty we ran into in inventory came about because last year management decided to pursue a policy of aggressively going after marketshare. They bought a lot of inventory – some of it was right but much of it was wrong. It certainly was too much so at this point we intend to work that down. Our priorities are that first and foremost we have to be profitable."

On Apple's financial future and shift away from a market share focus: "We will be not only financially more successful but also my experience has been when you do things well you can also grow the company and the result is you gain market share. But we don't want to focus on marketshare. We want to focus on delivering real value to our users."

On reports that Apple is abandoning its low-end Macs: "We do not intend to back away from that in fact if anything I think we need to work harder on trying to provide entry level computers that are attractive to new computer users that will get them excited about the Mac platform and allow them to build up their competency and ultimately move on to other higher scale and better machines."

On changes to the Mac product line: "We will be simplifying our product line because I think it's become incredibly complex but on the other hand we will add new, rich and robust features."

On moving toward modular software: "You will see us move more rapidly towards modular software. We feel that's a very very important concept that will allow our developers to create new applications experiences at a lower cost and at the same time give the use greater flexibility as to how they want to set up that application."

On improving communication of the company's direction: "I think that we have been in some ways too quiet. We need to talk about where we are and where we are going as a company and we intend to do that more vigorously in the future so that our incredibly loyal customer base can understand what they can expect from us."

On the chances Motorola will supply machines to Apple on an OEM basis: "That's a possibility but I think what you have to do is separate in your mind two aspects of the hardware. One is the hardware design. And then the other is the assembly process. We do almost all of our assembly right now but I think we've clearly said that as we go forward we're probably going to outsource. But the design and the basic feel of the machine is something we will do inside."

On price competition: "The simple reality is we're just not going to try to wage the battle on the basis of price. We can't win that way. What we intend to do instead is to create more value and have people choose us on the basis of value as opposed to price. I think for most people who have been Macintosh users over the years that's always been the case anyway."

• Amelio also promised a new era of openness, admitting that Apple had historically hid information, encouraging negative speculation.

As part of this new openness Amelio has promised to publish his own World Wide Web site. The home page will be a forum for questions and for the public to "learn about what's on my mind," said the prospective Web master. Apple has already set up its own 'open' Web site, **http://www.always.apple.com**, meant to rally the Mac community around Apple.

6300 UK OK

Apple UK has given the go-ahead for dealers to sell the Performa 6300, long since available in other European markets.

The Performa 6300 is the modular version of the popular all-in-one Performa 5300 – that is, the same system without obligatory built-in 15-inch screen.

It will initially be available with 8MB of memory, a 1.2GB hard drive and a quad-speed CD-ROM drive. The 6300 has a PowerPC 603e motherboard. It should cost less than £1,600 (including VAT).

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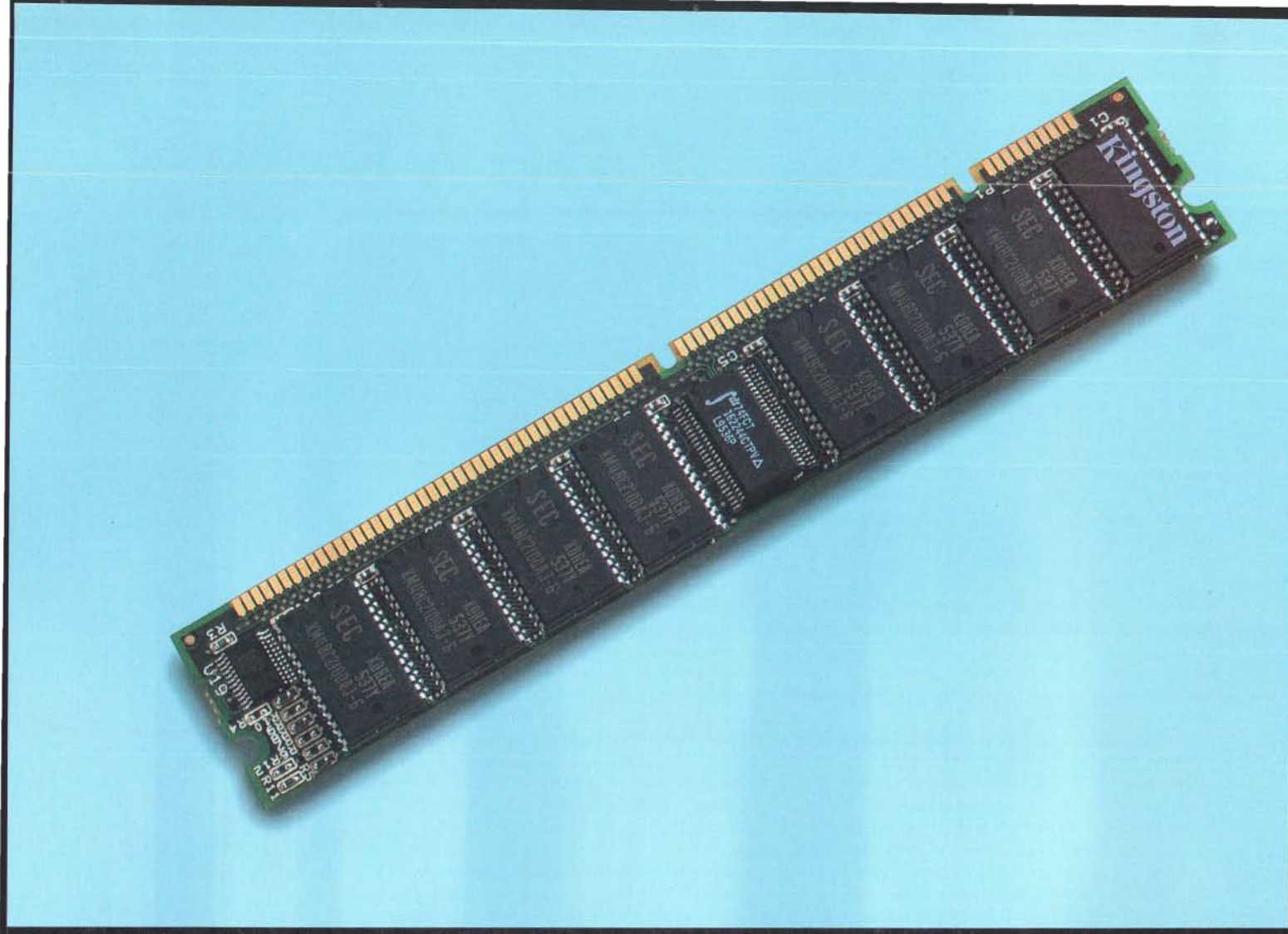

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Apple thinks big with servers galore

Four new PCI heavyweight contenders:

- 7250/120
- 8550/132
- 500/132
- 700/150

Heavyweight lineup
Apple's brand new 500/132 network server resplendent below

After all the commotion surrounding January's buyout rumours by server-giant Sun Microsystems, Apple has announced a weighty server roll-out of its own. Some are based on current desktop systems, while two hefty yet graceful departmental servers offer attractive new design solutions.

Internet servers bolstered

Faster PCI Macs and updated software

Showing its commitment to keeping the Mac in a leading role as an Internet server – after Unix-based systems, Macs constitute the largest group of PCs and workstations used to host Web sites – Apple has updated its line of Internet servers with two new systems: the PowerPC 601-based Workgroup Server 7250/120 (a 120MHz system based on the Power Mac 7200) and the 604-based 8550/132 (a 132MHz system based on the 8500).

Both come with Apple's Internet Server Solution 2.0, an upgrade to Apple's previous Internet server bundle that combines StarNine's WebStar Web server software with other Web tools. Apple continues to sell its Workgroup Server 6150/66, which remains the only NuBus-based Apple Internet server; the two new models, expected to ship by April, use the PCI bus.

All three systems have built-in ethernet and a quad-speed CD drive. The 7250/120 and 6150/66 come with 16MB of RAM and a 1.2GB hard drive, while the 8550/132 comes with 24MB of RAM and a 2GB hard drive. All three systems support Apple's software-based RAID levels 0 and 1, and the 8550/132 includes an internal SCSI-2 bus and an external SCSI-1 bus.

List prices range from £3,000 to £6,000. The prices include the Apple Internet Server Software 2.0 bundle, which is not available separately (upgrades from version 1.0 are free).

The version 2.0 software (worth over £2,500) contains upgraded versions of components in the original product: the WebStar 1.2.5 Web server manager; Adobe Acrobat Pro 2.1 portable-document software; AppleSearch 1.5.1; BBEdit 3.5.2; a trial version of Butler SQL from EveryWare Development; and numerous pre-configured Web sites, scripts, and other tools. New with version 2.0 are the Netscape Navigator 2.0 Web browser, the Adobe PageMill 1.0 Web-page publisher, Progressive Networks' RealAudio Server 1.0, MacDNS 1.1 domain-name server with load sharing, Maxum's NetCloak 2.0 scripting extension to HTML, Kitchen Sink Software's ServerStat 1.0 access-statistics analyzer, CityNet Express's MapServe and Kelly A. Campbell's WebServe image map software, Eric Lease Morgan's Email CGI, and EveryWare's Tango. Apple also includes Open Transport 1.1, which it says solves compatibility problems users experienced with the Open Transport 1.0.X networking architecture releases.

All-new AIX-based servers

AppleTalk support but no Mac OS

A year ago, Apple killed its A/UX Unix variant, forcing Mac-based Unix users to use the discontinued operating system or switch to Tenon's MachTen Unix. Now Apple is back in Unix, although with IBM's AIX version. For heavy-duty departmental serving, Apple has announced two new top-end servers, the Network Servers 500/132 and 700/150, which will ship by April. (The servers do not support the Mac OS.)

Targeted at mission-critical enterprise users in publishing, broadcasting, engineering, and education, the 500/132 and 700/150 servers feature the PowerPC 604 CPU, running at 132MHz and 150MHz, respectively. The servers come in a new doublewide tower form factor, which provides improved front-panel component access that doesn't require removing the enclosure, plus physical security features to prevent unauthorized access to controls and components.

Built-in features include dual PCI buses with a total of six slots, an internal SCSI 2 Fast/Wide bus, 32MB of RAM, redundant hot-swappable disks, and third-party UPS support. The 500/132 has seven front-accessible, hot-swappable internal storage bays; the 700/150 has nine.

UK list prices for the servers vary range from £9,600 to £13,000, depending on the configuration.

To the standard AIX feature set, Apple adds AppleShare 4.2.1, which supports up to 3,000 open files and 250 concurrent users, and graphical remote-administration tools for managing one or more servers directly from a Macintosh. – **Mel Beckman**

CD temptation

Will today's CD-ROM drives survive the DVD future?

For several years, deciding what CD-ROM drive to buy was about as simple as it gets: Double-speed or quad-speed? Internal or external? But this year, consumers are suddenly facing more hardware choices than ever before.

By this spring, the first 8x CD-ROM drives for the Mac will begin competing with drives offering 4x and 6x transfer rates. And by year's end, drives based on an entirely new, high-capacity CD technology called DVD (for Digital Versatile Disc) are expected to show up on store shelves.

Meanwhile, the promise of hardware speed enhancements is tempered by the fact that the vast majority of CD-ROM software developers are still optimizing their applications to take advantage of the now-obsolete double-speed CD drives' data-transfer rate.

JOHN BLECK

From 4x to 8x

Quad-speed drives offer data-transfer rates of 600 KBps – four times as fast as the first generation of CD-ROM drives, hence their name. Currently, 4x drives dominate the market and sell in stores for £150 to £400.

A few vendors are now selling 6x drives (with transfer rates of 900 KBps).

Meanwhile, NEC Technologies says it will be among the first to sell an 8x CD-ROM drive for the Macintosh. Although details weren't firm at press time, NEC's 8x drive will be available at a US street price of $450 to $500 (just over £300, but likely to be more expensive in the UK) by midyear.

Fast-Forward to DVD

Late this year, several CD-ROM drive developers – including Toshiba, Sony, Matsushita, and NEC – are expected to release the first DVD drives. DVDs have the same physical format as today's CDs, yet DVDs will store up to 4.7GB of data (compared with today's CD limit of 660MB). The increased capacity will let developers add copious amounts of full-motion, full-frame video (using MPEG-2 compression), 3D and virtual-reality animations, and other multimedia.

The first DVD drives are expected to be pricey, between $500 and $700 (up to £500). Although the hardware is still in development, DVD drives are expected to have transfer rates that exceed the 8x CD drives' 1.2GB per second. And while DVD drives will be able to play existing CD-ROM software, none of the current CD-ROM drives will be able to play DVDs.

But where's the software?

For now, most software developers are keeping their sights on the largest base of users – those with double-speed CD-ROM drives.

In addition, software companies aren't scrambling to keep up with the hardware because, for most applications, the 4x to 8x speed enhancements are "mostly incremental," according to Ted Pine, chairman of InfoTech, a multimedia research firm.

While developers say they're not focusing on optimizing software for the 4x, 6x, and 8x drives, the coming DVD format is another story. "That's where the real excitement in the industry is," says Stuart Burden, executive director of development for Compton's New Media. But developers contacted wouldn't comment on any specific plans for DVD drives.

So what to buy today?

The majority of software initially available for DVD drives is likely to be large databases, such as telephone directories and mapping programs, along with a few games. It will be at least late 1997 – some analysts guess 1998 and later – before DVD drives drop significantly in price and offer a variety of eye-popping, next-generation software titles.

As a result, a 4x to 8x CD-ROM drive will still be a viable purchase for the next 18 months or more, analysts agree. If you frequently download large chunks of data from a CD, you should buy the fastest CD drive possible, suggests Kathy Klotz, a multimedia analyst for market-research firm Dataquest. Otherwise, buy a top-rated drive at the best price, she says, and don't worry about the 4x, 6x, and 8x speeds.

– James Martin

Java Development Kit

The creator of the Java language is now the second company to support Java development on the Mac. Sun Microsystems' JavaSoft (0171 628 3000; **java@java.sun.com**) subsidiary has released the first beta of its Java Development Kit (JDK) for Mac. Natural Intelligence's Roaster was released in January (see *Macworld* March); both Symantec and Metrowerks plan to release Mac Java development tools by mid-year.

The JDK includes the Java virtual machine, the Abstract Window Toolkit, and the networking library for the platform-independent programming language for Web development. But JavaSoft isn't done yet, both the multimedia library and the Java debugger are missing. And informal testing of the tools confirm that they are far from stable.

Don't expect to visit any Java-enhanced Web sites with your Mac for a couple months, since no Mac Web browser supports Java yet. So far the only way to view Java applets on a Mac is with an applet viewer, such as the one included with the JDK. Both Netscape and JavaSoft plan to release Mac Java-compatible browsers in the first half of this year. JavaSoft has not set a release date for the final version of its Java development kit.

The Java Developer Kit for Macintosh installer is 2.5MB. It requires MacOS 7.5, a 68030 Mac or a Power Mac with 8MB of RAM, and 7MB of hard drive space. The JDK can be found at **http://www.javasoft.com/**. **— Jim Feeley**

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Macworld

All change on

High-speed Firewire beats SCSI to PowerPC Platform

With the next major revision to the Macintosh platform due in early 1997, based on the joint IBM/Apple design recently rechristened the PowerPC Platform, Apple is poised to change some of the Mac's basic peripheral-connection technologies.

One technology area is *Firewire*, a high-speed peripheral bus that might replace SCSI. The other technology area covers low-speed ports such as ADB and serial ports. Here, Apple's decision makers are wrestling over adopting Intel's Universal Serial Bus (better known as *USB*, and soon to be the new PC standard for serial ports) or sticking with the GeoPort serial design and the ADB design.

The Firewire Connection

The first in a new generation of high-speed devices using IEEE 1394 – the fast serial-port protocol pioneered by Apple as Firewire – are now appearing for digital video; expect to see 1394 become the standard for scanners, digital cameras, music, and storage devices within three years.

What Firewire Offers IEEE 1394 starts pretty much where the two slower protocols, GeoPort and USB, leave off, taking on high-speed data transfer. Unlike SCSI and USB – both of which support only a single host computer – 1394 supports multiple computers with up to 63 connected devices on a branching chain. Depending on the specific hardware, 1394 currently runs at one of three speeds – 100, 200, or 400 Mbps (800 and 1600 Mbps are expected in 1997). When two or more devices on the chain are communicating with each other, they automatically adjust to a mutually supported speed. Other advantages of 1394 include the ability to plug in devices without powering down the computer, and the elimination of device-ID conflicts because devices assign themselves addresses on the fly.

Containing only six wires, 1394 cable is much thinner, more flexible, and cheaper than a SCSI cable. And because 1394 cables can supply up to 60w of power, devices can operate without a separate power cord.

Who has Firewire on tap? The first products with 1394 are already on the market: two consumer digital camcorders from Sony, which use 100-Mbps 1394 to send images in a new compressed digital-video format called DVC.

Combined with 1394, DVC will quickly replace motion JPEG as the compression standard for video editing. DVC removes the last vestige of analogue signals in video production; its image quality surpasses that of the laser-video disc and professional Betacam formats.

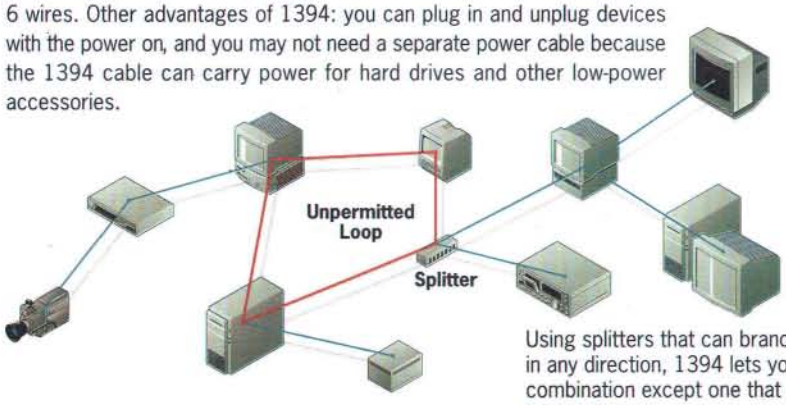
And high-end electronic musical instruments are adopting 1394 as a replacement for MIDI; a 1394 connection supports multiple streams of full digital audio along with MIDI-style control codes. For publishing, 1394 will help make lower-cost, higher-performance scanners and digital cameras possible.

In time, 1394 will also replace SCSI on storage devices, such as hard drives and optical drives. And high-end Television sets may someday come with a 1394 port and DVC decompression built in. A computer monitor could also connect via 1394, although a conventional monitor connection will still be cheaper for

Firewire (1394): faster and more flexible than SCSI

Already the standard for digital video, Firewire, now known as 1394, supports up to 63 high-speed devices you can connect in a treelike scheme, as opposed to SCSI's linear chain. Unlike the bulky and unreliable 25- or 50-wire SCSI cables, the compact 1394 cables and connectors contain just 6 wires. Other advantages of 1394: you can plug in and unplug devices with the power on, and you may not need a separate power cable because the 1394 cable can carry power for hard drives and other low-power accessories.

Firewire connectors are about a tenth the width of SCSI connectors and Firewire cables are about half the diameter of SCSI cables.



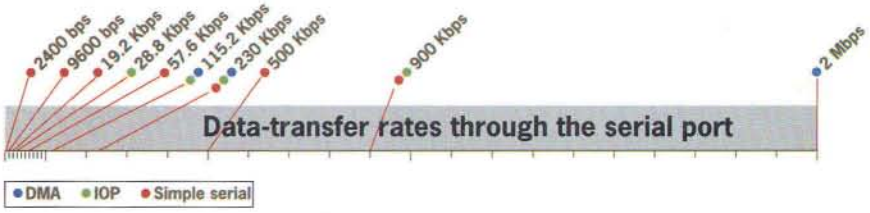
Using splitters that can branch cables at any point and in any direction, 1394 lets you connect devices in any combination except one that creates an enclosed loop (shown in red).

the Mac buses

some time. In 1996, PCI cards with 1394 will be available for Power Macs from SCSI-adaptor companies, such as Adaptec. By the end of 1996 or early 1997, expect to see Macs with 1394 built in – just as SCSI is now. Low-end computers will have a single 1394 port with an internal and external connector, while high-end machines will have multiple 1394 ports.

How fast is your serial port?

That depends on the type of serial port and how it's being used. Macs have three kinds: **DMA** (direct memory addressing) serial ports with GeoPort capability, in most desktop Power Macs (6100, 7100, 8100, and all PCI-bus Macs) and Quadra AV models; **IOP** (input/output processor) serial ports, in the IIfx, Quadra 900, and 950; and **simple** serial ports, in all other Macs, including all PowerBooks (even Power Macintosh models).



USAGE	SERIAL-PORT SPEED		
	DMA serial	IOP serial	Simple serial
With devices that provide external clock signals, such as fast serial-port printers (maximum speed)	**2 Mbps**	**900 Kbps**	**900 Kbps** (68020 or faster CPU) **500 Kbps** (68000 CPU)
Asynchronous communication with full CPU attention and LocalTalk turned off*	**230 Kbps**	up to **115.2 Kbps**	**57.6 Kbps** (68020 or faster CPU) **19.2 Kbps** (68000 CPU)
Asynchronous communication with LocalTalk or other high-speed activity on the printer port	**115.2 Kbps**	**28.8 Kbps**	**9,600 bps** (68020 or faster CPU) **2,400 bps** (68000 CPU)
LocalTalk for all Macs (peak speed)	**230 Kbps**	**230 Kbps**	**230 Kbps**

**Some conditions – such as inserting and (especially) initializing a floppy disk, running a IIsi or IIci with 8-bit on-board video, or turning on virtual memory – may result in missing data.*

Serial and ADB Ports

Deciding where to plug in low-speed devices – such as modems, printers, and pointing devices – has always been a simple matter for Macintosh users. But the limitations of ADB and serial ports could force Apple to change the Mac's low-speed port technology significantly by 1998.

Limits of the past With a maximum data rate of 10 Kbps, an ADB port can keep up with a mouse and keyboard, but not with a graphics tablet.

Older Macs' serial ports run at speeds between 57 and 900 Kbps, while desktop Power Macs and recent Mac AV models have a GeoPort, an improved serial port that runs at up to 2 Mbps.

GeoPort and serial-port speeds vary depending on the model, the specific serial devices connected, and whether both ports are working simultaneously (see above). But a GeoPort or serial port can connect to only one device at a time, and no Mac has more than two such ports. At least one PCI card with additional GeoPorts should be available by midyear. Apple anticipates mostly telephony products for the GeoPort, including devices that handle both voice and data.

The only GeoPort-specific hardware currently available, Apple's GeoPort Telecom Adapter, is limited to 14.4-Kbps modem connections. However, several companies have announced GeoPort support, including IBM (for its PCs) and AT&T (in telephony products). But overall, the GeoPort seems like a nice technology that can't do very much. Although Apple has moved toward industry-standard hardware interfaces, such as the PCI bus, it could hardly be expected to adopt the PC's standard low-speed serial ports, since they perform even more poorly than a Mac's.

Will Apple adopt another Intel bus? But now Intel wants to replace the standard PC serial ports with its Universal Serial Bus. USB has a peak rate of 12 Mbps, with usable throughput of 6 to 8 Mbps – fast enough for CD audio. Like Apple's ADB, USB supports multiple daisy-chained devices. It was developed as a kind of third-generation ADB (the second generation was Access.bus, a failed standard once promoted by Philips, which is still used in some monitors from NEC Technologies and Sony).

Intel plans to put USB on its Pentium and Pentium Pro motherboards. However, some obstacles may slow its adoption. Intel and Microsoft have different implementations of USB, but both methods can coexist without major conflict. And USB is more expensive to build into computers than either ADB or GeoPort.

When Intel was developing USB, it offered to give Apple advance information – *if Apple renounced GeoPort*. Apple passed but says it may adopt USB if PC accessories with USB come out in quantity at prices significantly lower than Mac accessories' prices, which isn't likely until 1997.

For now, there's no reason to put off buying an ADB, GeoPort, or serial-port device, but if you contemplate getting a big, expensive graphics tablet or an ISDN adaptor within the next year or so, you might want to consider a USB version. – **Cary Lu**

3D Active

Megatype (01739 388 988) is distributing Plastic Thought's 3d-Active 3D clip-art CD.

Macworld Expo hit 3d-Active collects together 54 copyright-free objects designed to work in Apple QuickDraw 3D format (3DMF).

Paste 3D objects into documents, presentations and Web pages. Each object includes models, QuickTime movies and textures.

Subjects range from business through furniture to toys.

Apple goes nuts on education

Apple UK and Acorn Computer have allied to create a new jointly-owned company to strengthen their position in the UK education market. Due to start trading in April, the as yet un-named company will be headed by Brendan O'Sullivan, previously managing director of Apple Computer Ireland, with David Lee, Acorn's managing director, as the chairman of the board.

O'Sullivan, explained the move, "Acorn and Apple share a similar vision and commitment to the education market. Acorn and Apple's heritage in education means that our education customers, software developers and reseller partners can expect increased investment in sales, marketing and solutions."

Acorn will begin its efforts for the new UK joint venture by selling its RISC O/S operating system, RISC A7000 PC, SchoolServer, Pocket Book and the forthcoming network computers, while Apple will bring its Power Macs, Performas, PowerBooks and Workgroup Servers to the party.

The alliance expects to adopt Mac OS as the underlying technology architecture for these solutions, and as part of the agreement, Olivetti has licensed Mac OS technology from Apple. The two companies said they will start the joint development to integrate Acorn's RISC O/S into the PowerPC environment this quarter.

Nigel Turner, director of new media and education, Apple Computer Europe, said, "This agreement with Acorn is part of Apple's strategy to focus on growing markets that can deliver customers secure future technology investments.

"This is an aggressive move by the partners to ensure that educationalists and government exploit the huge potential of technology in learning."

Exciting possibilities

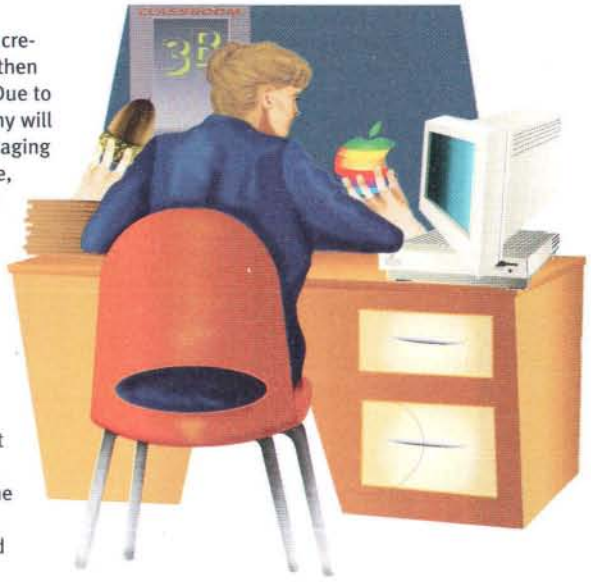
"It is certainly a good move for Acorn," said, Steve Turnbull, editor of *Acorn User*. "There was some concern initially, but in general the majority of people believe that it is a good thing. This means there is a one-stop shop for education."

Tony Speakman, Claris' UK sales director, was equally enthusiastic about the announcement. He said, "I think that it creates some exciting new possibilities for Claris in education. The pooling of resources provides a nice focused position for our software."

The news was not greeted with a universal round of applause. Mike Fischer, chief executive of PC vendor RM, said, "The end of RISC OS is a sad event but one that was inevitable.

"It also seems an unlikely alliance for Acorn as many of their difficulties over recent years have been as a result of supporting proprietary platform while the market is moving towards PCs. Perhaps the most expected path was for Acorn to adopt the PC platform."

He added, "The venture looks very much like Apple are trying to acquire a ready-made customer base in the, very unique, educational IT market. However, to be successful in the educational IT market in the UK needs industry expertise." – **Mary Cowan**



GEORGINA WATSON

Apple pips Acorn in UK schools' RISC strategy

• The Olivetti Group has completed its long-expected deal to license the MacOS in Europe, but is keeping silent on its long-range plans for the operating system.

The licensing deal is part of a broad agreement between Olivetti and Apple to develop technology and products for the European education market (see above). For now, Olivetti officials say MacOS applications ported over from Acorn's RISC OS are narrowly targeted for UK schools only. Though Olivetti has been hinting that it would license the MacOS for the past year and a half, it was low-key about its decision to finally license the MacOS in Europe.

"As I understood it they're going to be moving RISC OS (applications) over to the MacOS – although they haven't said so directly, the implication is that they need to license the MacOS to do this," said Terry Ernest-Jones, a senior consultant with market researcher International Data Corporation.

StrongArm Newton

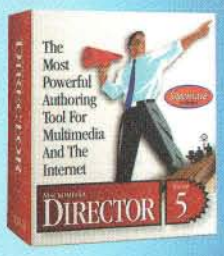
Personal digital assistant users frustrated by platform limitations could get help from DEC's StrongArm, a microprocessor designed to give high computing performance at low voltages.

Indeed, Digital officials said they have spoken with Apple about including the 32-bit StrongArm in the next version of the Newton PDA.

"A lot [of our interest] has to do with the performance possibilities. The speed of it is just phenomenal," an Apple spokeswoman said.

"You're talking Pentium performance on a penlight battery," said analyst Terry Shannon.

StrongArm also has built-in support for sound, voice and handwriting recognition; "That extra functionality will be especially [interesting] for the next generation of PDAs, which now struggle with handwriting recognition," said Tim Bajarin, president of Creative Strategies.



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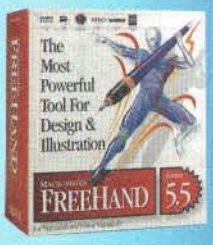

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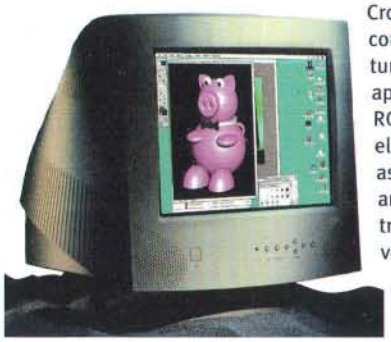
Screens of the future

New CRTs and LCDs from NEC

Screen technology is one of the fastest moving areas in the computer market today. Last month *Macworld* took a look at Texas Instruments' forthcoming Digital Light Processing display technology. Now, it's the turn of NEC (0181 993 8111) to trump its monitor rivals, with new CRTs and LCDs.

NEC's *CromaClear* cathode ray tube (CRT) technology improves on existing displays through an alternative phosphor alignment and a mask design pioneered by the television industry.



CromaClear's Slot Mask combines the best features of dot-trio and aperture grill CRTs. The RGB phosphors form an elliptical arrangement as opposed to the triangular format of dot-trio screens and the vertical stripes used in aperture-grill CRTs. Using a shadow mask, CromaClear CRTs do not require dampening wires as used in aperture-grill CRTs. Dampening wires are often visible and mechanically obstruct the flow of electron beams, critical to maximizing image focus.

The first products to use this technology are the MultiSync M500 and M700, 15- and 17-inch monitors respectively.

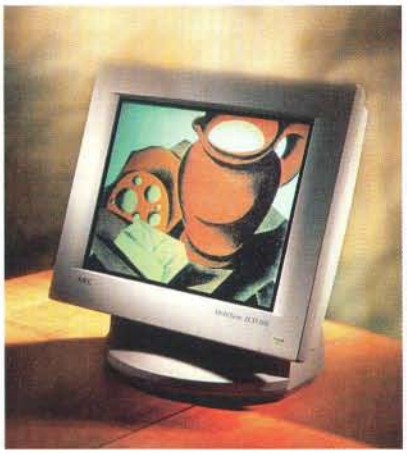
Both monitors have built-in speakers and microphone. UK pricing was not firm at the time of going to press, but it is expected that the M500 (pictured left) will cost around £400 and the M700 around £800.

Visionaries have long predicted that LCD panels would replace CRT monitors as the standard display device, but the high cost of active-matrix screens in monitor sizes – thousands of pounds each – has kept that no more than a vision.

Now, NEC has brought it a little closer to reality (in the US, anyway, for the time being) with the $4,000 12-inch MultiSync LCD200 and the $6,000 13-inch MultiSync LCD300. While hardly competitive with the $300 to $500 for a 14-inch CRT, these prices are a third of what NEC charged for last year's comparable 13-inch LCD1280 LCD display.

The higher costs are attributed to the meticulous manufacturing process of LCDs. Because an active matrix LCD is one large integrated circuit with hundreds of thousands of separate transistors, each must be produced without failure. A non-functioning transistor will appear as a white (clear) spot on the display. Currently, there is no testing method for non-functioning transistors until the end of the manufacturing cycle, leading to low yields.

A significant display technology NEC brings to the table with these LCD monitors is analogue signal compatibility.



NEC's big, bright, clean and crisp LCD displays look impressive and cost much less

Other direct-view LCD monitors convert standard, analogue video signal output to a digital signal, losing colour and clarity in the process. The NEC MultiSync LCD family displays colour and resolutions in the same manner as a CRT monitor.

Effective CRT replacement

Digital panels employ dithering – the mingling of dots of several colours – to achieve different colours. 256 colours therefore produce what appears to be a continuous colour palette, but at the cost of sacrificing resolution.

I evaluated a prototype unit for its visual quality, since LCD panels historically don't have the clarity that CRT monitors do.

The result?

The screen is big, bright, clean, and crisp. I did notice the slight pixelation that all LCD panels seem to have compared with a CRT, and fluorescent lighting can make colour backgrounds lighter. But it is clear that an LCD panel can be an effective replacement for a CRT.

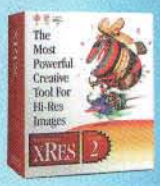
The LCD200 monitor supports multiple resolutions, including 640 x 480, 800 x 600, and 1,024 x 768. The MultiSync LCD300 achieves a maximum resolution of 1,280 x 1,024, the highest available from any LCD manufacturer.

– Simon Jary and Galen Gruman

Scans get personal

Personal document scanners have taken desktops by storm, and the £310 ScanJet 4s is Hewlett-Packard's (01344 369 222) entry. The 200-dpi greyscale scanner comes with Visioneer's PaperPort 3.0 document-management software.

For less text-intensive jobs, Storm Software's (001 415 691 6600) EasyPhoto scanner , pictured here, is a quick and easy way to scan in photographs. The 24-bit colour scanner handles originals up to 5 by 7 inches, and comes with software for scanning, editing, and displaying your images. The $259 scanner is currently awaiting UK distribution. **– Cameron Crotty**



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Who needs the lottery?

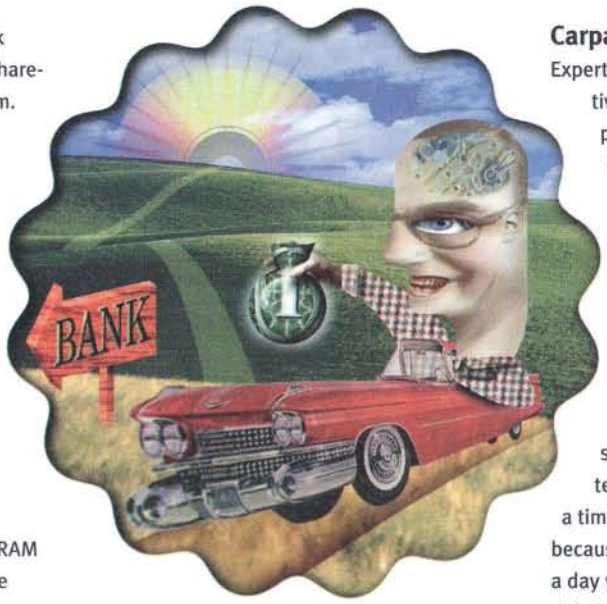
Eight best-selling Mac products that don't exist – yet

by David Pogue

In 1985, Raymond Lau, a New York teenager, wrote an obscure shareware file-compression program. Its name was StuffIt; now he's rich. In 1990, Lloyd Chambers wrote a little program known as DiskDoubler; today, he's driving a BMW. A programmer I know wrote a couple of shareware programs; now he makes $28,000 a year in shareware payments alone.

Such stories prove that the success fable can happen – even today. Invent the right gadget, solve the right problem, fill the right niche, and the world will beat a path to your e-mail address. Look at ATM, or FileMaker, or RAM Doubler. You, too, like Bill Gates, can be worth $20 billion by age 35.

In fact, I'm going to make it easy for you. I'll give you the ideas. All you have to do is be the first to produce and market these best-sellers-to-be. Selfless altruist that I am, I ask for nothing in return – except a handshake, a mention in the Read Me file, and 10 per cent of the gross.



Concatenator Pro

Can somebody explain to me why Apple's CD-ROM drive requires five extensions in your System Folder? Why Microsoft Word 6 needs six extensions just to run? You need three extensions for QuickTime, seven for PowerTalk, eight for QuickDraw GX – and, incredibly, twelve for Open Transport!

Why can't programmers confine their start-up code to a single extension icon? I don't care if it's a 2MB icon – I just don't want to have to turn twelve extensions on or off individually to disable some feature.

That's why Concatenator Pro will be a hit. It's a simple drag-and-drop application: round up as many extension icons as you like, drop them onto the Concatenator Pro icon, and it spews out a single extension icon that incorporates the code of all of the originals. How glorious: you'll have one icon for CD-ROM, one for file sharing, and so on. Troubleshooting and configuration will be so much easier!

In the unlikely event that you need your original splintered constellation of extensions back, you can drag your concatenated superextension icon onto Concat Pro's icon again – and this time, it spits out the original batch.

Uninstaller Plus

For years, a program called Uninstaller has been a best-seller in the DOS/Windows world. But nobody wrote a Mac version. People said the Macintosh didn't need it. To remove a program, you just drag it to the Wastebasket.

Right?

Not anymore. Today's programs deposit their own proprietary junk into your Preferences, Extensions, Control Panels, Startup Items, and other folders.

What we need is a quick, simple utility that clears out all that crud when we remove the culprit program.

Carpal Diem 1.0

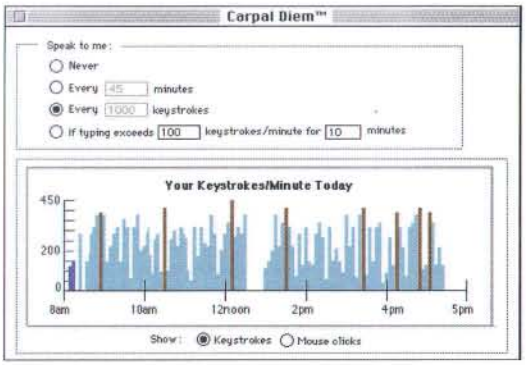
Experts say that the keys to avoiding repetitive strain injuries (RSIs) are correct posture and regular breaks. But we all know that when you're deep in that hypnotic Mac trance, sucked into some brainstorm or round of Myst, the real world evaporates. You're supposed to be thinking about ergonomics and rest breaks? Forget it.

Enter Carpal Diem, a small but ingenious Macitosh control panel. It shows you graphically exactly how rotten your typing habits are, displayed as a time line (see "Carpal Tunnel Panel") – because what matters isn't how many hours a day you type, but how intensely you type, right?

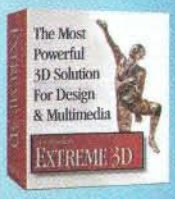
Better still, the program can display friendly reminders – not just every few minutes, as the shareware program TakeABreak does, but every few thousand keystrokes, which is what we really care about. It can also print out clever little reports that analyze your work habits and make suggestions.

Alas, nobody will write this program. Some user would get wrist pain despite Carpal Diem's advice, and the lawyers would descend like rain.

continues page 50



Carpal Tunnel Panel
The Carpal Diem control panel graphs your keyboard and mouse activity for the day.



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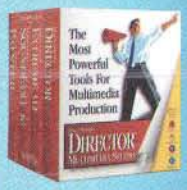

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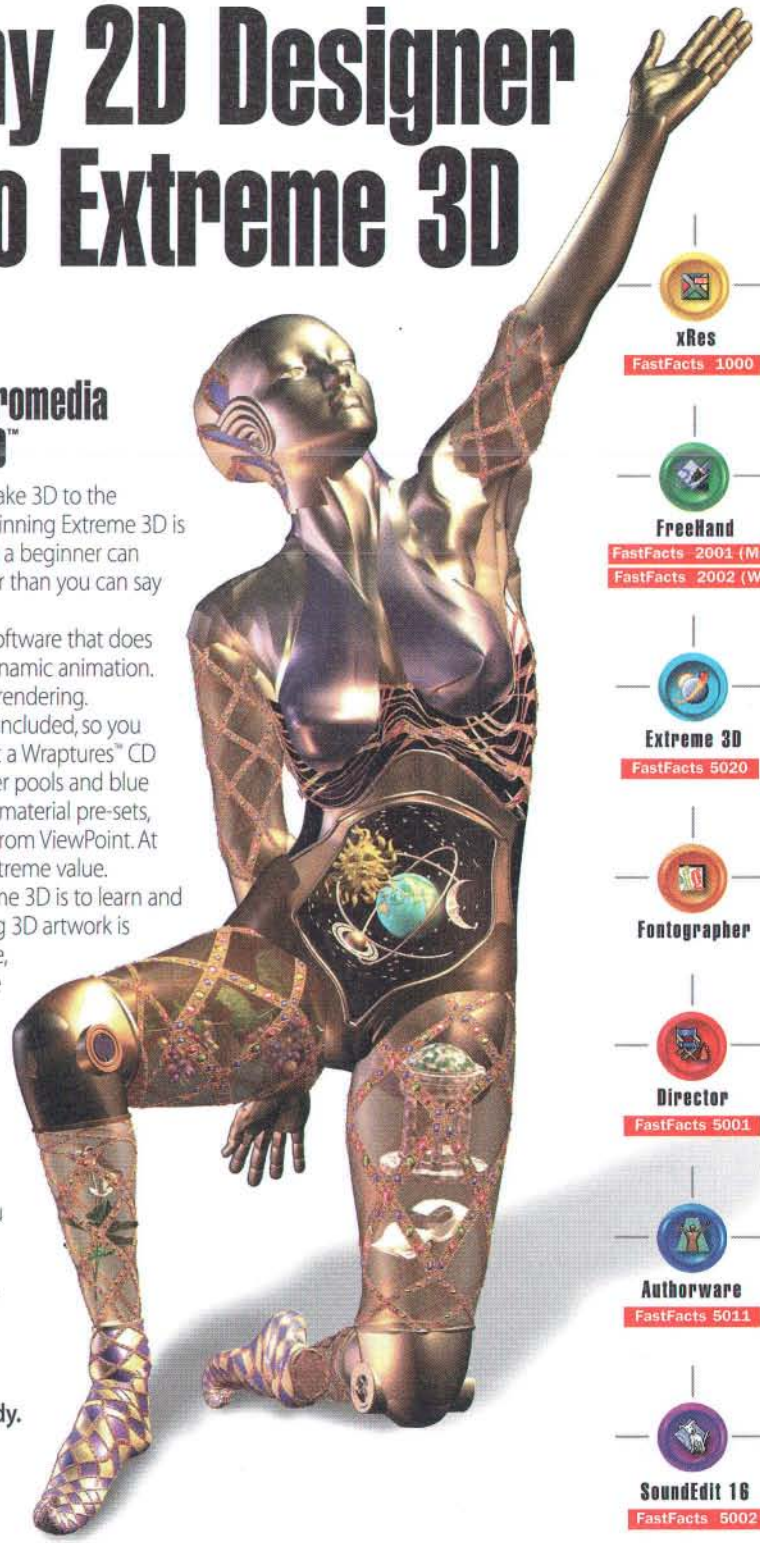

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www.pricedex.com

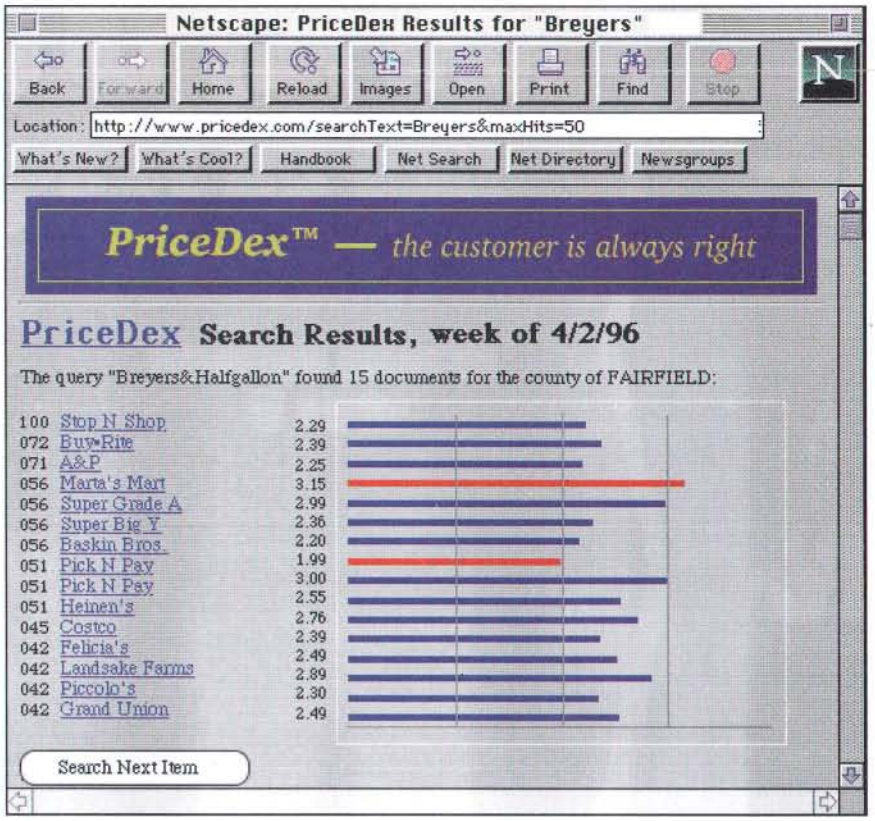
You see these ads all the time: "We will not be undersold!" "We'll beat any price!" "Stella Artois, 99p this week only!"

Half the time, though, I suspect we're being scammed. The advertiser knows we don't have time to comparison shop for each little 99p item. We're helpless. Shoot, how would anyone know what Stella Artois normally costs?

The PriceDex Web page changes all that. Each week, this service accepts a modem dump from every shop in your area. Each transmission contains that store's inventory and current price list.

All you have to do is dial in and search for the item you want. Immediately, you're shown a list of local stores that carry it – and a graph of the various prices (see "www .pricedex").

"Aha," you're thinking, "but what shop in its right mind would participate in such a program?" The answer is, of course, all of them. Each would be too paranoid to consider being left out. And the dealers that genuinely do offer good prices would be only too happy for the free advertising.



www.pricedex
The PricesDex Web page. Each shop's name is a Web link to additional store information.

VideoSpigot

The SuperMac VideoSpigot was a cheap, simple NuBus card that turned your camcorder footage into high-quality QuickTime movies. Customers came by the thousands, gobbling up VideoSpigot cards.

So what did SuperMac do? It discontinued the VideoSpigot.

Today, if you want to make QuickTime movies, you have a handful of unappetizing options. Choice A: Buy a "pro" card in the £5,000 range (like the Truevision Targa-2000). Choice B: Buy a QuickCam for about £100 – and live with its jerky, low-res, black-and-white movies. Choice C: Buy a new Mac that has built-in video inputs. But except for the Power Mac 8500, those Macs make QuickTime movies with a top speed of 15 frames per second – too jittery. Choice D: Get a SpigotIITape, the VideoSpigot's descendant. But it, too, has essentially been abandoned – Radius has no plans to make it compatible with QuickTime 2.0 or System 7.5.

Between those prices, meanwhile, stretches a market niche screaming to be filled. What's wrong with these companies? Why don't they reintroduce the plain old Spigot? I say: If you build it, they will digitize.

QuickTime Performer

I'm astounded that nobody has thought of this: a music sequencer that uses QuickTime 2's Musical Instruments as a synthesizer.

For years, music recording programs like Mark of the Unicorn's Performer and Opcode's Vision required a MIDI synthesizer keyboard for playback, since the Mac could produce only four cheesy notes at a time.

But then Apple licensed 30 realistic instrument sounds from Roland, the synthesizer maker, and included them with QuickTime 2.0. With these Musical Instruments and the right software, your Mac can be a MIDI synthesizer. Some notation programs can use Musical Instruments. But the world still waits for a genuine, tape-recorder–like, music-recording program – sequencer – that's clever enough to use Musical Instruments.

Such a program would bring cheap, high-quality music-making to schools worldwide, to PowerBook-porting presenters, and to music hobbyists everywhere. And a cool wad of dosh your way...

ExtensionsWorld Magazine

A brand-new Power Mac 8500 comes with 120 extensions – right out of the box. How is the ordinary Macintosh fan supposed to keep them all straight?

Yes, folks, it's *ExtensionsWorld*, the magazine for those who loathe the jungle in every System Folder. Each issue also contains a listing of every single extension, enabler, patch, and system update Apple has ever released, complete with information on where to get it, whether to get it, and whether you can throw it away.

PocketBoot

Why is it that the faster the Mac model, the longer it takes to start up? My Power Mac 7100 takes nearly two minutes to start up, and almost four minutes to recover from a system crash. That's why the PocketBoot is such a terrific gadget. It connects to your SCSI jack, and contains about 2MB of RAM. That's just enough room to store the information your Mac needs to start up. With all of this stored on a glorified RAM disk – the PocketBoot – your Mac will start up in about eight seconds. So, the PocketBoot will save you about 35 hours each year of sitting there staring at the Mac OS logo.

The Upshot

Right there you've got enough great ideas to make eight millionaires – and I haven't even told you about the Modem Port Multiplier, the Word Toolbar Eraser, or the Newton Home Entertainment Center Remote Control Kit.

But if you play your cards right, and you'll follow the path of self-made computer-industry entrepreneurs before you. You'll experience the Five Phases of Ultimate Product Success: glowing reviews, acclaim on the Internet, blockbuster sales, enormous profits, and finally, buyout by Microsoft. MW

NUMBER NINE
VISUAL TECHNOLOGY

IS YOUR POWER MAC BEING HELD BACK BY ITS FRONT END?

You're a speed freak, right? Hungry for power. It's why you chose a Power Mac, isn't it. Power. But what if all that performance is ultimately congested by a graphics card damming the raging flow to a pathetic trickle?

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Look at the chart. Read the small print. Devour every ounce of information on this page and then scream down to your nearest Number Nine dealer, pay him his own weight in diamonds (street price may vary), and take pride in owning the ultimate in video cards. Feel the power coursing through your Mac for the very first time. It's a drug. Get hooked.

Test performed on a Power Macintosh 9500/132, with Adobe Photoshop 3.01, 45MB image, at 1152x870 pixels, 16.8 million colours.

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Take avoiding action

Acting like the captain of the *Titanic*, Mike Spindler steered Apple Computer into a financial iceberg, so he was shown the door. I doubt that any Apple old-timer in his position could have done much better. The seeds of Spindler's problems were sown years earlier when Apple decided to pursue fat profits by keeping its advanced technology to itself. In its technological arrogance, the Cupertino company couldn't conceive that an iceberg in the shape of an obviously inferior operating system could possibly threaten the Apple ship.

We all know that Apple's computers are more or less brilliant to use. By any measure, except popularity and software availability, they knock the competition into a cocked hat. But I have to confess that in another life I am a software publisher, and guess what platform I have to develop for first?

That's right, Windows.

I'm trying to give my customers a Mac-like experience, but a Macintosh version won't appear until we've finished the Windows one. All over the world, software publishers make similar decisions. Even in markets where Apple excels, most of them are adopting a dual platform strategy. Even so, Macintosh still excels at certain applications.

This is what led Apple to decide to focus on specific markets. Last year Don Norman, head of Apple's Advanced Technology Group, told me that the company is to focus on 'anything where Apple is strong, where we actually have very large market share, as opposed to worldwide business – we'll let the M company do that. We'll do the important and valuable things. We'll do the human things.' Specifically, the company is focusing on publishing in all its forms, mobility, education and the home. While these represent huge and healthy markets, I wonder if Apple isn't being a little naive. Does it really understand the forces that operate in the real world?

I work in a business centre and, just before Christmas, people started popping their heads round my door to ask for advice about home computer purchases. The conversations followed an entirely predictable pattern:

Them: "What is the best computer?"

Me: "Macintosh."

Them: "Yes, but surely I should buy a Windows machine?"

Me: "So why waste my time?"

I then told them to ask their kids what they wanted. None of them wanted Macintoshes because they wouldn't be able to 'swap' software with their friends.

My son's school switched from Macintoshes to PCs, telling me that they had to prepare children for the world they will find outside, *currently* a Windows world. I couldn't argue with the logic, although I was enormously irritated that the children would grow up thinking that all computers were difficult to use.

Just recently I visited a graphic designer chum who, despite having worked for IBM, always uses a Macintosh. Having heard Apple's intention to focus on specific markets, he became very despondent.

"But don't they understand, I'm not just a graphic designer, I'm a businessman as well. I want to use the same machines for my business applications," he moaned.

If Apple's market focus strategy scares off business application developers, then he may have to abandon the Macintosh for something with a broader application repertoire.

Maybe Apple has calculated that irritating a large number of one-man-bands is a fair price to pay for focusing on the needs of big budget design departments. The assault on the home and education markets may founder because of the real world forces created by Microsoft and Intel.

I doubt that the Wintel iceberg will melt so let's hope that Gilbert Emilio, the company's new boss, can take avoiding action. At least he's an Apple outsider, so he should bring a fresh perspective to the company's problems. MW

Check out David Tebbutt's home page, on
http://ourworld.compuserve.com/homepages/TEBBO and
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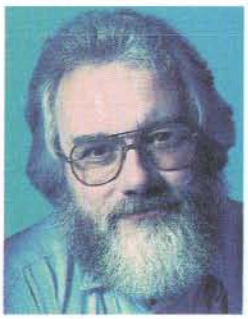
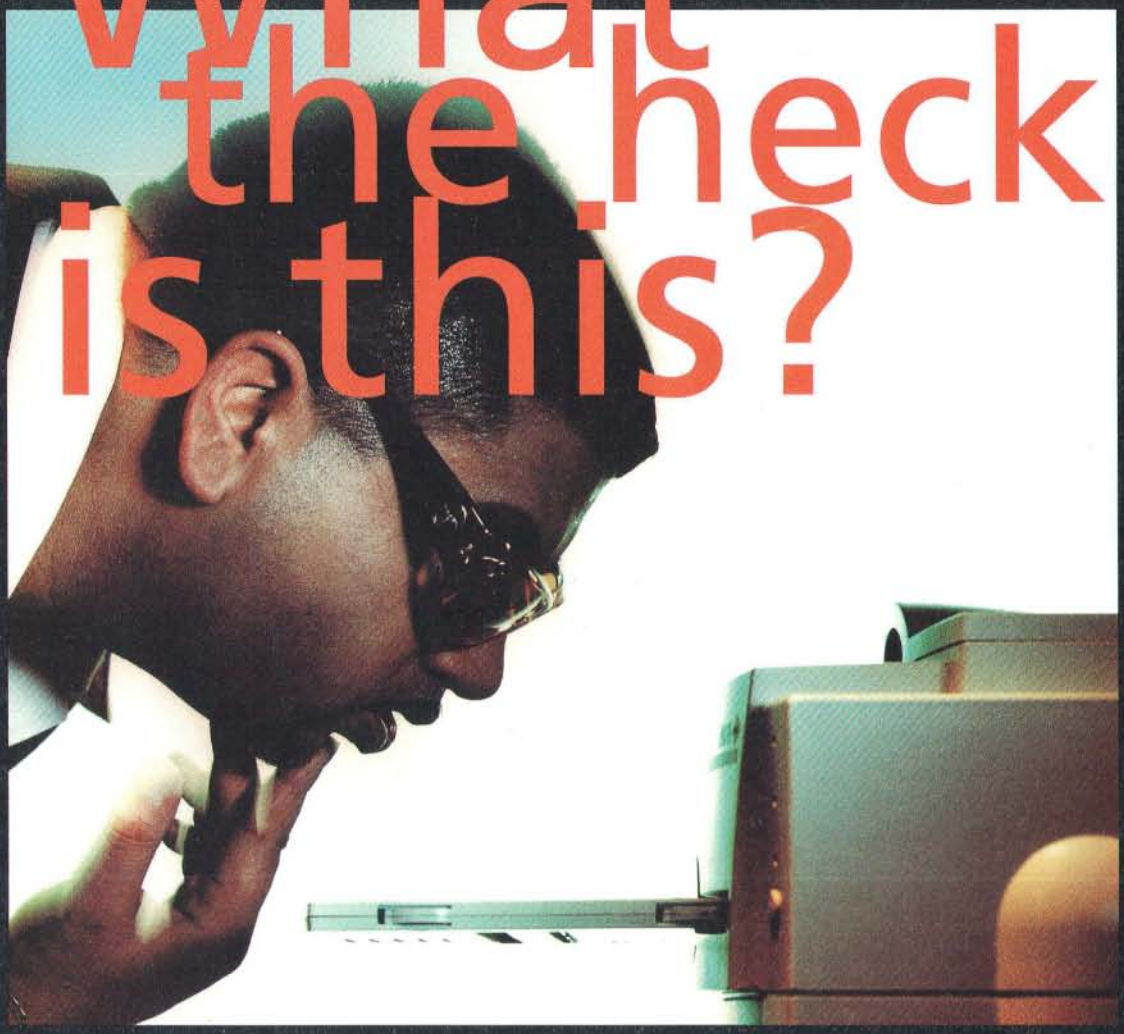


My advice to Apple's new boss – steer clear of the icebergs...

What the heck is this?



A DuoScan,® they tell you. A desktop scanner with two loading areas? A two-bed scanner? Yes, they say. So you can load transparencies while you scan reflective art. And with a dedicated bed for each, you can get better scans from both. Then you look at the dynamic range. And you look at the resolution. And the speed. And then you know exactly what it is. It's something that's going to make your life a lot easier.

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Michael Prochak

Pick up a penguin

One of my small pleasures in life at the moment is buying piles of those 60p Penguin pocket editions prominently displayed in most major bookshops. Along with the Wordsworth Library with its essential reference and classical works on offer for a paltry £1.99, these gems provide a pleasant way to re-visit old literary favourites or replenish long-standing gaps in one's yellowing paperback library.

Apart from the price, what really makes these books compulsive is the quality of their content. The fact that the paper is rather thin and the whole presentation is less than glitzy doesn't detract from the fact that what these books actually contain is valuable, interesting and worthwhile.

Now compare the Penguin or Wordsworth list with your average CD-ROM title. Instead of diverse compelling content, most commercial CD titles still rely heavily on spectacle and presentation to differentiate themselves from their printed counterparts.

Content remains at best, superficial and topics are narrowly focussed on oddly perceived or re-purposed 'consumer' markets. If we're honest, most of the so-called interactive media we have now, such as CD titles, the Internet and its ilk, are generally boring. Unlike the Penguin or Wordsworth titles, there are few CDs that are good value, interesting or attractive enough to actually 'use' more than once or twice.

I'm not saying that multimedia lacks potential. The new media universe currently under construction has loads of creative potential and could be used to create a more interesting and egalitarian society. However, the down-side of multimedia and our burgeoning infatuation with the Internet is the increasing acceptance of what has been termed the 'integrated spectacle', characterised by things like incessant technological renewal, integration of state and economy, generalized secrecy, unanswerable lies and an eternal present.

The emphasis on spectacle over content means that digital media tools and techniques such as imaging and photo-manipulation used extensively to create new media have begun to seriously erode important aspects of verification. While initially amusing, the possibilities for misuse in news reportage and historical documentation become rather more sinister as we become ever more anaesthetised by exposure to increasingly realistic and fantastic digital effects.

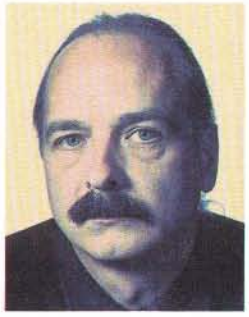
As we've recently seen with the *Scott Report*, if you happen to control the mechanism that operates the only form of social verification to be fully and universally recognised, you can say pretty much what you like. Spectacle, digital or otherwise, proves its arguments through Disney-esque sophistry because that is the only thing everyone gets to see.

Such spectacle combined with power can similarly deny whatever it likes, knowing full well there is no danger of any riposte. Unanswerable lies are successfully eliminating public opinion which is replaced by mistrust of one's own experience, belief in bald-faced lies of our rulers, loneliness and resignation. In a spectacle-driven society, everything is so thoroughly internalized that we simply learn to dismiss our own experiences if they diverge too far from the 'official' story.

While film-like spectacle is great to look at, film-like budgets continue to insure that CD titles remain expensive – and superficial. But hopefully, as digital media begins to get closer to a more book-like publishing model, that might change. Since it's possible today to produce competent multimedia on even the most basic Mac system, I've begun exploring the possibilities of creating the equivalent of a 'paper-back CD'. Like the 60p Penguins, these would put content first and high-res eye-candy second.

Design and digital effects could still display relatively high production values without incurring high production costs and the range of titles could be diverse and niche-driven with limited press-runs and simple packaging. Best of all, these paper-back CD-ROMs could, in principle, be sold for under £10.

Now, more than ever before, the mass media is up for grabs with practically everything around us colliding and converging into one large digital data stream. Digital media spectacle and content, in one form or another, both have the potential to seriously change how we know what we know. I just hope some of us remember how to tell the difference. MW



The sinister dangers of fantastic digital effects

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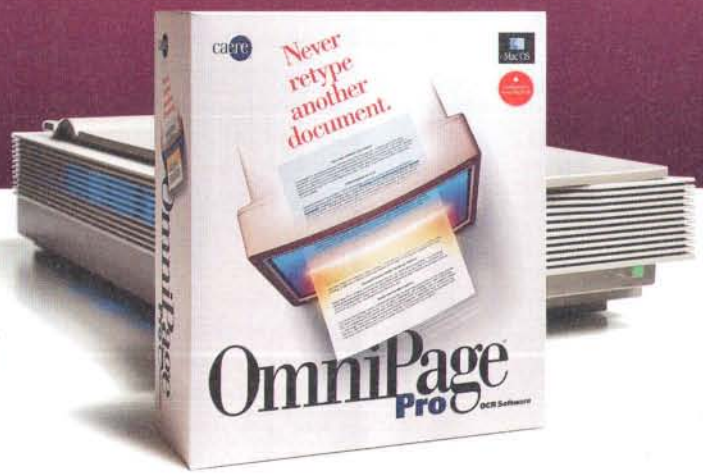

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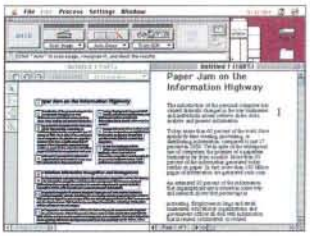

OmniPage Pro 6.0 is ten times quicker than the fastest typist—and still delivers pinpoint accuracy.

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One-Mississippi, two-Mississippi

Why do Macs take so long to get started?

by Steven Levy

One of the sacred precepts of personal computerdom is that over a period of years, or sometimes even months, machines get cheaper, more powerful, and best of all, faster. When journalists, technologists, or flacks want to illustrate how impressive this is, they usually revert to some variation of the following analogy: "If cars followed the same price/performance curve as computers, the Rolls-Royce that cost $100,000 in 1970 would now cost 80 cents, would get 1,000 miles to the gallon, and would travel at six times the speed of sound."

The mind reels – what if you were tailgated by that guy? No one would blame you for dismissing this whole business as some high-tech fairy tale. Yet there's proof that Moore's Law – the equation that says every 18 months chips get twice as powerful and cost half as much – truly delivers better computers at lower prices, year after year. The same cash that bought the original Macintosh in 1984 (with 128K of RAM and the Motorola 68000 processor) now buys a colour Performa (with 8MB of RAM, a heavy-duty 601 RISC chip, and a quad-speed CD-ROM drive).

I've had a lot of time to think about this lately, because I've been testing a fresh-out-of-the-factory PowerBook 5300c. Apparently, some of these units – mine included – had some sort of gremlin in the system software that made for some strange behaviour. The first sign of trouble came at start-up. After depressing the power button, I and others similarly afflicted experienced a more-than-generous interval before the machine was ready for work. How much time? Over five minutes, now that you ask. This was ample time to contemplate not only issues in technology, but diverse subjects like the national budget, the odd yet welcome Jane Austen revival, and the simmering debate as to whether the new millennium will truly begin on the first day of the year 2000 or as some literal-minded types insist, on the same day a year thereafter.

Now, I am informed by an Apple spokesperson that this long start-up process is not normal; something was awry. And indeed, sometime after I returned the unit, Apple announced a fix that presumably cut the launch time. Still, just last summer I tested out a Power Mac 9500, the mightiest unit Apple has offered to date, and though I never took a stopwatch to it, my nonscientific verbal countdown (one-Mississippi, two-Mississippi...) went well past the two-minute mark between turn-on and turned on. And the Macintosh I use most, my trusty PowerBook 180, routinely takes over a minute.

To a Macintosh veteran like myself, this has a profound and disturbing significance. I remember the criticism levelled at the original Macintosh on its introduction 12 years ago. Not the least of its perceived flaws was a lackadaisical quality that manifested most glaringly on start-up. Unlike the other computers of the time – the IBM PC and the Mac's older cousin, the Apple II+ – the Macintosh did not spring to attention immediately, but engaged in what seemed an interminable conversation between the internal and external floppy disk drives before the folders finally appeared on screen and you were finally ready for work. Apologists looked on the bright side, suggesting that this break was a perfect time to fix yourself a cup of coffee. We pioneers understood: the Mac was hardworking but underpowered.

And now, 12 years later, with a Mac several hundred times more powerful, on starting up the machine we still have time to brew coffee. The faulty PowerBook even

gave me time to grow coffee beans. So much for the Rolls-Royce that outspeeds the space shuttle.

The designers of today's computers, particularly the geniuses at Apple's R&D division at One Infinite Loop, are great at making machines more powerful, but severely lacking in clues as to how to make that power work for us. (Incidentally, this problem is no longer unique to Macs – start-up on a Windows 95 machine also allows ample time to watch paint dry.)

I'm sure there are solid technical explanations for the long boot-up period – after all, the software is much more complicated than it was in 1984, and the Mac performs so many more tasks. And this problem does not necessarily extend to everything: many tasks – opening files, say – do take much less time than in those early days. Maybe that's why it's so infuriating to confront the mini-eternity of waiting when you start up.

So if any of you designer types are reading this, let me slip you some advice: we don't want computers that can go faster – we want computers that do go faster. From the very start. As any runner will tell you, the most important part of the race happens at the starting gate. MW

***Macworld* contributing editor Steven Levy is a technology columnist for *Newsweek*. He is the author of several books on computer technology, including *Insanely Great: The Life and Times of Macintosh, the Computer That Changed Everything* (Viking, 1994).**

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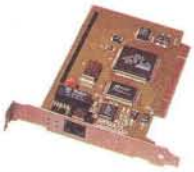

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product news

edited by Mary Cowan

printers

Océ 6465EX

Océ has launched a 600-dpi colour laser printer, which doubles as a colour copier.

The 6465EX (below) prints at 3-6 ppm in colour, and 12 ppm in black and white. The optional colour copying facility connects via the SCSI interface and comprises a flatbed scanner and software. It can produce three

colour copies per minute. The 6465EX comes with an ethernet or Token Ring interface, 32MB of memory and SCSI interface. It costs £7,995.

Océ has also announced the 9200 network printer series. The three printers in the range have Océ's Power Print Controller that accepts and spools data from up to three interfaces simultaneously. They also feature Océ's Copy Press printer engine, which provides resolutions of 240, 300 and 600 dpi, switchable per job. Prices start at £25,145.

Océ Printing Systems, 0181 502 0038.

TechJET Color GT

CalComp's TechJET Color GT series is a family of colour wide-format ink-jet plotters.

Replacing the TechJET Color Inkjet Series, the GT range produces colour images at 360 dpi and mono at 720 dpi. It offers seven plot modes, including a four-pass mode for image smoothing and a bi-directional mode for added throughput.

Prices start at £3,275 for the A1-size and £4,025 for the A0. Both models have 6MB of internal memory. A PostScript version of the A0-size model (£4,775) includes an internal PostScript language Level 2 compatible interpreter and 16MB of memory.

CalComp, 01734 320 032.

DocuPrint 4517mp

Rank Xerox has launched its first 17 ppm mono network laser PostScript printer – the DocuPrint 4517mp.

It contains the first confidential mailbox/collator for a network printer, and has a maximum paper capacity of 1,350 sheets. It comes with 6MB of memory, and prints at 600 dpi with DP-Tek TrueRes image enhancement to smooth jagged edges for crisper text.

The DocuPrinter 4517mp costs £2,280.

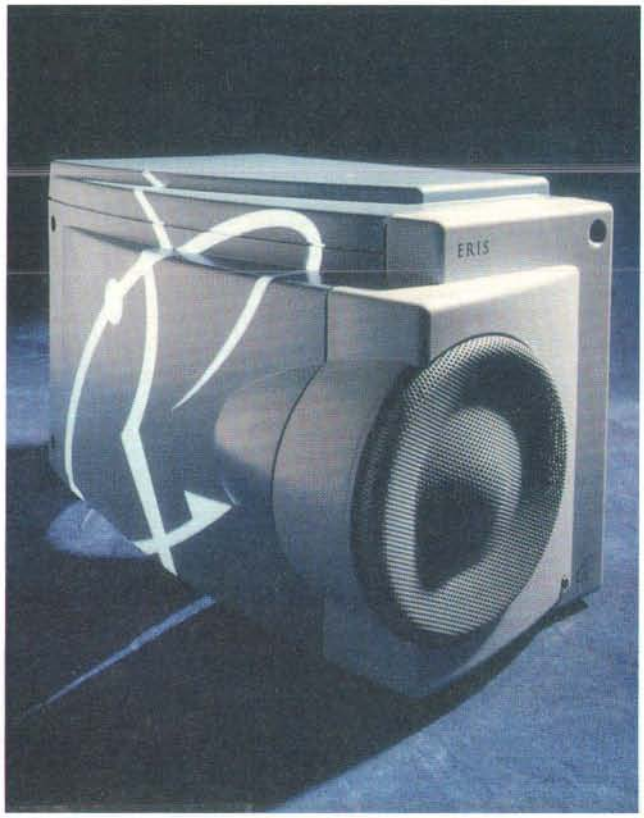
Xerox, 0800 787 787.

Tektronix Phaser 550

Tektronix has introduced the Phaser 550 colour laser printer, which prints at five pages per minute in colour and 14 ppm in black and white. It also claims to be the first desktop colour laser printer capable of printing at 1,200 dpi.

The Phaser 550 (below) uses World Wide Web technology to provide printer management across a network. Instead of

installing proprietary software, users need only a standard Web browser. Tektronix's PhaserLink provides information, including job status, toner levels and paper-out warnings. The Phaser 550 costs £5,795.



Fax Tektronix's 24-hour worldwide Highly Automated Library on 01908 681 839, or obtain additional details at **http://www.tek.com/color_printers/** or call 01628 403 600.

scanners

S3400 ChromaGraph

Linotype-Hell's S3400 ChromaGraph drum scanner comes with three different drums that have scanning formats ranging from 250 x 250mm to 650 x 500mm. The scanner's height-adjustable scanning head allows a scaling range of 10-3,000 per cent and can handle both transmission and reflection originals.

One hundred 35mm originals can be scanned in a single pass using the robot scanning feature. The drums have a top resolution of 19,200 dpi. The S3400 ChromaGraph costs £63,000.

Linotype-Hell, 01242 285 000.

continues page 60

Video communications

RSI Systems has launched its portable visual communications system – Eris (above).

RSI claims Eris is the first cross-platform system that links PCs and Macs by ISDN for video conferencing, and is also the first to work with laptops. Eris is self-contained and easy to use. It simply plugs into the SCSI or PCMCIA interface. This lets multiple PCs and Macs use the same Eris unit. It uses AT&T video compression technology for high-quality video.

The full system costs £4,250 and consists of a desktop unit with an integral speakerphone, colour video camera, cables, software and documentation.

RSI Systems, 01924 840 888.

product news

Linotype-Hell Opal

Opal (above) is a 30-bit single pass colour scanner, capable of scanning all types of originals ranging in size from 24 x 36mm up to A3.

Its double-lens technology means that the resolution can be optimized to the size of the original. The standard resolution of 400 x 800 dpi can be used for A3 formats with magnifications of up to 300 per cent. Originals up to 15cm can be scanned at resolution of 800 x 1,600 dpi, allowing magnification of up to 600 per cent.

The scanner (£8,995) is bundled with Linotype's colour management software LinoColor Lite and ScanOpen ICC Lite, scanner calibration software. It is also shipped with a ScanLite plug-in for Adobe Photoshop as well as a full edition of Photoshop.

Linotype-Hell, 01242 285 071.

Agfa Horizon Plus

Agfa has announced enhancements to its large format (A3) Horizon Plus flatbed scanner – called the Horizon Ultra.

It offers an increase in speed and improved output resolution, up to 2,000 dpi, and Agfa has reduced its price. It is now provides true 36-bit sampling at 12-bit per colour, and can provide 10 to 24 colour scans per hour for 4 x 5-inch transparencies.

The Horizon Ultra costs £15,699, and comes with FotoTune, Photoshop and FotoLook software, plus slide holders for 'offline' set up.

Agfa, 0181 231 4141.

Agfa DuoScan

Agfa's latest flatbed scanner, the DuoScan (below), has an optical resolution of 1,000 x 2,000 ppi, and a scanning depth of 36-bit colour, 12-bit per colour. It offers a maximum resolution of 4,000 ppi.

Its TwinPlate design lets users scan reflective art and transparencies on separate beds for greater control over the focal length of the optical path. The top cover can be adjusted or opened fully for scanning bulky originals.

The DuoScan costs £3,750 and comes bundled with the Agfa scanner CD, FotoLook 2.08, FotoTune Scan, and FotoFlavour, plus Adobe Photoshop 3.0.

Agfa, 0181 231 4200.

displays

Brilliance 15A

Philip's new 15-inch monitor comes with Brilliant Sound – a sound system co-developed by Philips Speaker Systems.

The Brilliance 15A also has an integrated microphone that can be used for voicemail, video-conferencing and presentations. It can handle resolutions of up to 1,280 x 1,024 non-interlaced. It costs £350.

Philips Business Electronics, 0181 689 4444

presentation

Film recorder range

The Lasergraphics family of film recorders are now available from IMC. The range comprises:

the recently updated entry-level PersonalLFR Plus priced at £5,995; the LFR-X now priced at £7,250; and the LFR-MkII, which provides 36-bit colour and 4,000 resolution, costs £10,250. The top-of-the-range LFR-MkIII (above) is a photo re-touching model with a line resolution of 8,000, and it costs £18,750.

IMC, 01344 872 800.

Astro scan converter

Ginsbury's Astro Design SC2020 scan converter (£17,500) now accepts inputs from Mac and Sun workstations, as well as any RGB video source from 15KHz to 80KHz horizontal scan.

The SC2020 is designed to convert high-resolution computer graphics into standard television format for use with video tape recorders, video projectors and TV monitors in real time. Conversion is to PAL or NTSC format. Optional outputs are component video, Betacam, and D1 digital serial/parallel.

Ginsbury, 01634 290 903.

communications

Accura 288 price cut

Hayes Microcomputers has cut the price of its Accura 288 v.34 + Fax modem from £249 to £199.

Data Guardian, 01276 686 888; Frontline, 01256 841 841; Ingram Micro, 01908 260 160; Merisel, 0181 490 9000; Northamber, 0181 391 2066; and Persona, 01372 737 475.

connectivity

Cayman Marina 130

The Marina 130 Global Access Server, is the latest addition to Cayman's range of internet solutions.

It combines a Tri-Media ethernet connection with three high-speed serial ports and support for the Point-to-Point Protocol (PPP). It supports the TCP/IP protocol, and provides access to Internet services such as e-mail, FTP and the World Wide Web.

The Cayman Marina 130 is priced at £999.95.

Computers Unlimited, 0181 200 8282.

DynaStar 100 and 100i

Dynatech Communications has enhanced its family of DynaStar 100 and 100i multiservice access routers.

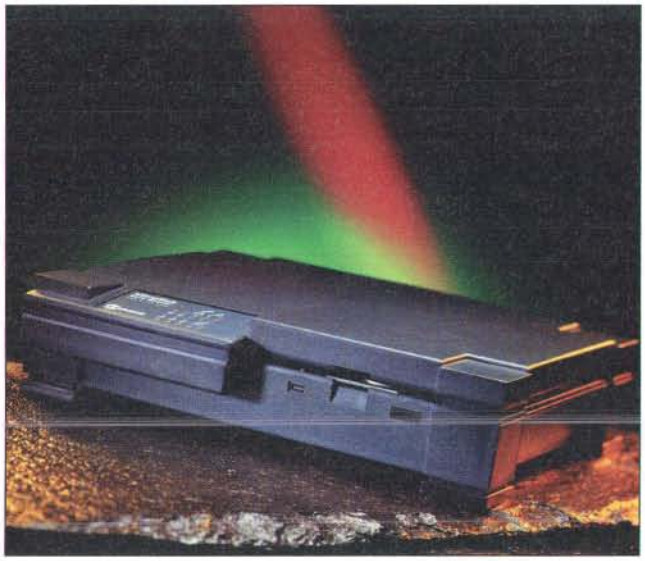
Enhancements include: multilink PPP support delivering wire speeds of up to 128 Kbps by interleaving packets over two ISDN-B channels; and a new multi-level access feature.

For upgrade information, call Dynatech Communications on 01992 633 513.

Ultralink EuroRouter

The Ultralink EuroRouter from PMC Consumer Electronics, combines the high data throughput of ISDN with V.34 PSTN connectivity.

It provides LAN-to-LAN and user-to-LAN connectivity with routes to TCP/IP and IPX net-



works primarily via ISDN, but with the back-up of a V.34 modem.

The Ultralink EuroRouter (above) costs £1,599.
PMC Consumer Electronics, 01274 532 000.

storage

Deltis MOS 540E

The Deltis MOS 540E from Olympus is a 5.25-inch magneto optical drive with data transfer rates of up to 4 Mbps and a retrieval time of 25 ms.

Olympus claims the drive's improved performance is due to its Enhanced Cache Algorithm, and the internal 4 MB buffer that accelerates the processing of larger files. The drive will cost approximately £1,500.
Olympus, 0171 253 2772.

Maxoptix T4-260

Maxoptix's 2.6GB optical drive – the T4-260 (below) – is backward compatible with 1.3GB and 650MB media. It has a data transfer rate of 4.65 Mbps and is priced at £2,495.
Ideal Hardware, 0181 286 5000.

SCSI Express drives

Micro Design International's SCSI Express 2.6GB magneto optical drive is backward-compatible with 1.3GB and 650MB media. It has a disk rotation speed of 3,600 rpm and a transfer rate of 2-4 MBps.

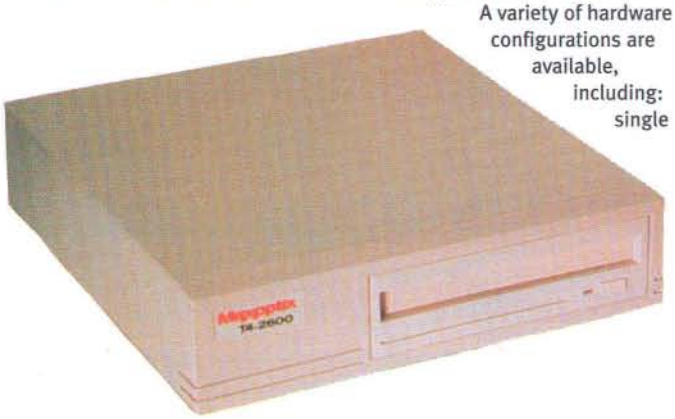
Micro Design has also introduced the SCSI Express CD6X . Claimed to be the fastest six-speed CD-ROM drive available, it features a 900 KBps data-

transfer rate, 145ms random access time, 115ms random seek time, and a 256KB buffer.

It offers support for CD-XA, CD-I, Video CD and Multisession Photo CD as well as the normal ISO6990 and Mac formats.

A variety of hardware configurations are available, including: single internal drives, from one to four external drives in interlocking enclosures; seven-high towers, and 28- and 49-drive cabinets with MDI's bundled CD-ROM Extenders option.

Prices for both products have yet to be announced.
GBC, 01753 511 177.



product news

software

FrameMaker+SGML

Adobe FrameMaker+SGML 1.0 (£1,195) is now available for the Mac/Power Mac platform. It is the first integrated authoring and publish software that lets you create, edit, and publishing SGML (Standard Generalized Markup Language) documents in "a WYSIWYG environment".

Based on SGML, HTML is the standard language used for publishing on the World Wide Web.
Adobe, 0181 606 4000.

VirusScan for the Mac

McAfee's VirusScan is now available for the Mac, priced at £49.95.

VirusScan has a point and click detection – it claims to remove 99 per cent of known Mac viruses. It also has automatic scanning at system startup and file execution, a virus encyclopedia, and certification by the National Computer Security Association.

A full version can be downloaded for free 30-day evaluations from **http://www.mcafee.com** or **ftp.mcafee.com.**
McAfee Associates, 01344 304 730.

Voice-activated game

Marty and The Trouble with Cheese is the first in a new line of Maxis voice-activated software designed for children aged between two and five years.

Marty, is controlled by microphone only, so once you start up the program you can put the mouse and keyboard away, out of reach of sticky little fingers.

The adventure unfolds as the player helps Marty find his lost cheese. Along the way, you will meet new friends such as the

continues page 62

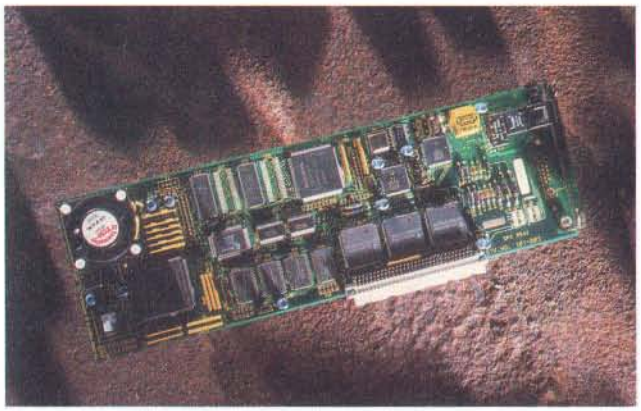
New monitor range

ViewSonic has introduced three new monitors. The SonicTron PT-770 (top) is a 17-inch monitor equipped with a 0.25mm aperture-grill mask and a maximum resolution of 1,600-x-1,280 pixels. At 1,280 x 1,024 it achieves a refresh rate of 77Hz. It costs £819.

ViewSonic's £379 15-inch multimedia monitor (middle) features two hi-fi loudspeakers. Volume controls and an integrated microphone are positioned on the front panel, and there are connections for an external microphone and headphones. At 1,024 x 768 pixels the 15GA has a refresh rate of 86Hz.

If you need a big screen, ViewSonic offers a new 20-inch monitor that costs £1,039. Its 20G monitor has a 50cm screen that provides non-interlaced resolution up to 1,600 x 1,280 and a high refresh rate of up to 76Hz at 1,280 x 1,024. It also has a BNC input and complies with the EPA's Energy Star standards.
ViewSonic, 0181 781 1856.

product news



Two NuBus primary rate ISDN cards

In response to the need for faster data transmission Harmonix has launched two NuBus cards for primary-rate ISDN.

The Hi-Card/M30 can use all 30 channels of a primary-rate circuit as one point-to-point aggregated call, handling up to 14 MB per minute without compression. Or it can be used as part of a server, sending and receiving data from up to 30 locations simultaneously.

And for those who want to take advantage of the low per-channel price of a primary-rate circuit, but require less than the full 30 channels Harmonix offers the Hi-Card/M15.

Both cards are compatible with 4-Sight International's full range of pre-press software. The Hi-Card/M15 costs £4,000, and the Hi-Card/M 30 cost £5,750.

Harmonix, 01823 433 711.

mimicking crow who repeats your every word, laugh and giggle.

Maxis, 0171 490 2333.

OmniPage Pro 6.0

Caere has introduced a PowerPC-native version of its OCR program OmniPage Pro (below).

Version 6.0 (£595) features Caere's Quadratic Neural Network (QNN) technology. QNN

achieves more accurate character identification by defining the differences between similar looking or poorly-formed characters.

Other features include direct input, which lets you run OmniPage Pro from within word processing applications without having to switch between applications; and HTML output support so you can convert paper documents directly to HTML.

Caere, 0171 630 5586.

HexWeb XT

HexWeb XT (£349) is a new XTension from HexMac International that translates and formats QuarkXPress documents as Web pages.

Features include the automatic remapping of text attributes in the original to HTML stylesheets; a HebWeb Index, which automatically generates a table of contents for the exported publication including hyperlinks and headlines; and the ability to automatically export all links.

XChange International, 0171 637 2966.

accessories

Office Care kits

Ribbon Revival and US company Falcon have released cleaning kits for computers and peripherals.

The new range called Office Care cleans everything from mice to ink-jet printers, overhead projectors and other technology. Prices range from £3 to just over £30.

Ribbon Revival, 01481 729 554

Ergonomic Keyboard

Lindy Electronics has launched its Mac Ergonomic Keyboard (below) – with a specially designed 106-key extended keyboard.

Available for £44.99, the keyboard incorporates a membrane contact technology and works with system software 6.07 and over. It plugs directly into any Mac and has two extra ADB ports.

Lindy Electronics, 01642 765 275.

Replace your mouse

The Gyropoint Desk (£119) and Gyropoint Pro (£299) from Gryrations aim to replace the traditional mouse.

Controlled by gyroscopes, the pointing devices don't need a surface to run on as they can be used in mid-air. Requiring just a slight flex of the wrist to operate, they aim to reduce fatigue and the risk of RSI.

The Gyropoint Desk plugs into the existing mouse port and needs no extra software to run. It can be used on the desk as a normal mouse, or as a point-and-click device.

The Gyropoint Pro is a wireless device that can be used up to 75 feet away from the base unit. Designed mainly for presentation use, it can operate on any one of eight different channels.

For more details and pricing call Ideal Hardware, 0181 286 5000.

cd-rom

Good Practice Details

Produced in co-operation with Butterworth-Heinemann, this CD contains over 140 drawings for use in CAD packages. All the drawings are fully vectorized.

Normally priced at £289, the pack is available at the special price of £199 for a limited period.

Skymark Systems, 0171 435 9023.

books

Making the Most of Midi

Making the Most of Midi by Paul Overaa, (Bookmark Publishing, ISBN 1-85550-006-X) explains the fundamentals of Midi and Midi sequencing for the beginner. It also deals with issues that arise for more established users.

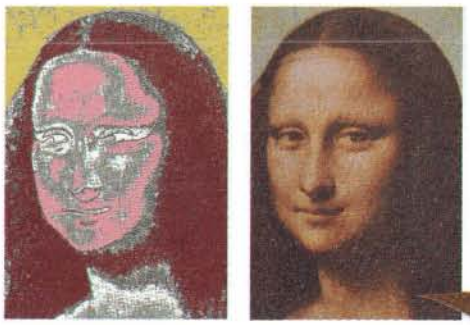
There's advice on Midi fault finding, on the less obvious tricks used by experts and help for musicians using sequencers with live bands.

It costs £14.95.

For more details call Bookmark Publishing, 01525 713 671

The difference between backing up and restoring.

Nobody backs up just for fun. You do it for the day your hard drive goes soft and it's time to restore. That's when you see the difference between Retrospect® and the rest. Only Retrospect easily restores all your data to its former glory.



Retrospect saves all your preferences, everything. So you don't have to spend countless hours restoring whatever masterpiece is on your hard drive.

1. *Beware of dragging files.* If you've been "backing up" by dragging files, you'll have an unpleasant discovery when it's time to restore. Even if you've kept up to date with all your files, what you'll still be missing is every preference, configuration, and font – all the stuff that reflects the way you work.

Think about this the next time you're "backing up" by dragging: Retrospect can scan 200 files a second to see which files have changed. Can you?

2. *Recovery tools don't recover everything.* At best, it's a partial recovery. At worst, you have a fire, flood, or theft, and those tools won't recover anything.

3. *Other backup software leaves you exposed.* You're forced to individually restore each incremental backup. The dentist is more fun than that. Only Retrospect has SnapShot™ technology that tracks the most recent state of your hard drive. So complete restoration is accomplished in just one step, in only minutes.

4. *Don't play the odds, you'll lose.* Half of you are going to lose a file, a document, or everything this year. Think about it: one single file could be worth more than Retrospect's entire price tag.

Answer a few questions and Retrospect's new EasyScript™ creates a customized backup strategy that includes backup frequency, scheduling, and media rotation.

5. *The world's foremost restoration artists.* Don't leave yourself wide open to disaster. Buy the software with the awards, the raves, and support for almost every SCSI tape drive ever made. And every Retrospect benefit is multiplied many times over with Retrospect Remote®– our backup answer for network users.

To save your data, call your local dealer – before it's too late.

dantz® *To go forward, you must backup.®*

Retrospect 3.0 now shipping!

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turboDAT £599!

inc Retrospect 3.0, installation kit

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4-16 triple DAT £948
(other enclosures available)

tape	external	media
4-16 quad	£898	£16
4-16 triple	£868	£16
4-16 Turbo	£728	£16
4G Turbo	£678	£16
2G Turbo	£599	£5

Since our DAT was a 5-mouser best buy, we've doubled the buffer size for even smoother backup, doubled the speed and doubled the capacity! No wonder it won the best peripheral category of the MacUser awards! And now we've doubled the speed again! Speeds of 50-70MB/min are possible! Full compatibility with DDS1 standard drives (2GB and 2-8GB). Power Macintosh optimised. Retrospect 3.0 software, tape, cleaning tape & cables included.

MacUser

1GB disk £248

external, inc UK installation kit

hard disks	seek	int/ext
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1000	10	£198/248
2000	8	398/448
4000	9	748/798
9000	10	1578/1678

seek times are average, "effective" seek times are all faster. All drives are fast SCSI2.

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Now's the time to retire that slow old 40-500MB drive. Our 1000MB drive outperformed every other 1GB drive in MacUser's gigabyte drive test. Yet none had a lower cost per megabyte.

Upright "F" enclosure option:

Powerbook 440MB £1.
suits all models 100-28

New! 640MB 3.5" 2600MB 5.25"

1.3 MO includes Formatter 5 worth £135

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1.3GB Optical £998

twins from £316

Twin drive mini-arrays, and fixed/removable combination drives. Add together external & internal price, or order just one drive in the twin enclosure, and be ready to upgrade for the cost of an internal drive... - e.g.
2GB+2GB=£946; 1GB+230MO=£576.

Buy into a standard with Magneto-Optical. Non proprietary, Faster and more reliable than Zip, and if you have more than 10 cartridges of data, you'll pay less too! Ask for our new data sheet: "Choosing a removable drive". Ask about powerbook internal 230MO drives.

prices with 1 disk	drive	media(5)
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200MB Syquest	£298	£42
EZ Syquest	£178	£15
640MB Optical	£448	£38
230MB Optical	£368	£15
128MB Optical	£218	£15
2.6GB MO	£1998	£65
1.2/1.3GB MO	£998	£38

CDWriter from £599
Quad speed CD £148

98% of orders shipped from stock. All external drives have 90-270V power, twin 50 way SCSI, push button ID switch, platinum grey horizontal or upright ABS plastic housing. External drives include UK mains cable, SCSI system cable, terminator, software, 1 piece media. DAT drives also include cleaning tape.

Warranty: 1, 2 or 3 years. **Delivery**: £8 courier. **Prices exclude VAT.**

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WAVE

Improve your Mac's performance by boosting its memory!

WIN! 16MB of Southland memory worth over £500!

Performance Direct is one of the UK's leading retailers of Mac-related memory. It stocks all the familiar brand names and has recently become the UK distributor of memory products from Southland Micro, one of the leading brands in the US.

Macworld, in association with Performance Direct, is offering four lucky readers the chance to each win 16MB of Mac memory **worth over £500** from Southland Micro Systems.

Performance Direct offers free advice to callers, a 30-day money-back guarantee on most products plus a promise to match or beat any supplier's price.

To enter the competition, simply answer the five questions below, complete the response box and send it to: Macworld Memory Competition, 99 Gray's Inn Road, London WC1X 8UT.

1 Which American President said during World War II, "No man and no force can abolish memory"?

a President Roosevelt
b President Truman
c President Reagan

2 Who wrote the poem, on which Andrew Lloyd Webber's 'Memory' from the musical CATS, is based?

a DH Lawrence
b George Elliot
c TS Elliot

3 For which type of Apple computer are DIMMS designed?

a Classics
b PCI Power Macs
c Quadras

4 Performance Direct offers which of the following:

a A 30-day free trial on most of its products
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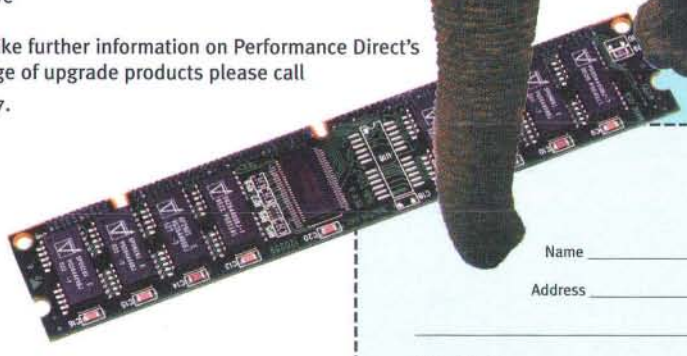
d All of the above

If you would like further information on Performance Direct's extensive range of upgrade products please call 01784 477 477.



NB: Upgrades will be limited to one machine per person and will be supplied for any type of computer.

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How would you like to enhance your Mac? ❑ more RAM ❑ more storage ❑ connectivity ❑ all of these

Answers: Q1____ Q2____ Q3____ Q4____

How many Macs are there at your place of work? _____ Which models do you use? _____

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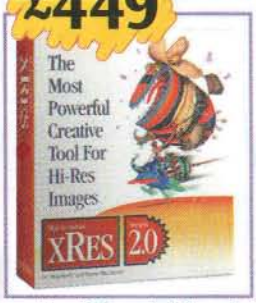

Macromedia xRes is the most powerful creative tool for high resolution image editing, with a complete suite of retouching, natural texture painting, and compositing tools. The perfect complement to Adobe Photoshop, xRes combines high-speed, high-resolution image editing with familiar interface conventions and power features that benefit your creativity. Selective processing enables users to see their edits on-screen in near real-time and batch processing allows your computer to work after hours so that you don't have to. Adobe Photoshop users will be comfortable with xRes' familiar imaging conventions, including floating objects, selections, filters, and alpha channel transparency. Layering multiple image elements is easy with xRes' objects which include their own undo and channel information. Multiple undos lets you explore your creativity without fear. Text objects allow the freedom to place and move text at any time. With the power to create and edit hi-res files fast without extra RAM or hardware, Macromedia xRes is an essential tool for any graphic designer.

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WRD5	Microsoft Word 6.0 (market leading WP heavyweight)	£265.00
NSWR	Nisus Writer 4.0 (multiple languages capability)	£99.00
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WRNB	Write Now 4.0 (fast, includes Correct Grammar)	£45.00

DATABASES

4DFR	4D First (low cost relational database)	£95.00
ACTA	ACT! (excellent contact management)	£149.00
CORG	Claris Organiser (full featured new database)	£45.00
EXPR	Expresso (actual desktop diary for your Mac)	£20.00
FLMK	FileMaker Pro 2.1 (best flat file, everyone needs it)	£95.00
FLMR	FileMaker Pro 3.0 (now with relational features)	£165.00
FOXB	FoxPro 2.6 (fast DB with great interface, reads dBase)	£85.00
INFG	InfoGenie (info organiser, supercedes QuickDex)	£45.00
NOWB	Now Up-To-Date 3.5 & Now Contact 3.5 Bundle	£55.00
OMNW	Omnis WorkGroup Edition (10 user client/server)	£475.00
CKBD	Three by Five (5 mouse rated computer "corkboard")	£65.00
TPBP	TouchBase/DateBook Bundle (contact & calendar)	£35.00

BUSINESS

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ASTD	Astound 2.0 (fabulous new version)	£185.00
CLWR	ClarisWorks 4.0 (market leader of the integrated world)	£95.00
EXCL	Microsoft Excel 5.0 (market leader, great features)	£265.00
MSOF	Microsoft Office 4.2 (Word, Excel, PowerPoint)	£375.00
WRKS	Microsoft Works 4.0 (WP, DB, Comms, Draw, SSheet)	£69.00
PERS	Persuasion 3.0 (high end presentations with outliner)	£255.00
PWPT	PowerPoint 4.0 (powerful, intuitive, easy inteface)	£265.00
STKW	StockWatcher (analyze stocks, commodities etc.)	£145.00

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MCMY	MacMoney 4 UK (home accounts/budgeting package)	£65.00
MYOB	MYOB 5.0 (fully integrated single user business accounts)	£145.00
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-MEMORY-

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64Mb DIMMS 60ns	from £1445.00
PowerBook RAM	call

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CLDW	ClarisDraw (powerful, easy to use draw package)	£89.00
ADIM	Dimensions (Adobe's 3D extension for Illustrator)	£110.00
PSER	Fractal Design Poser (create human figures)	£119.00
FRND	Freehand 5.5 (professional PostScript drawing & text)	£315.00
INFD	Infini-D 3.1 (leading 3D modelling & rendering tool)	£525.00
ILST	Illustrator 6.0 (pro PostScript drawing, text & layout)	£299.00
KPTK	Kai's Power Tools 3.0 (amazing filters for Photoshop)	£95.00
KPTV	KPT Vector Effects (Illustrator/FreeHand FX Plug-Ins)	£95.00
KPTC	KPT Convolver (adds power and ease to Photoshop)	£95.00
KPTB	KPT Bryce (3D Skies and landscapes)	£95.00
LIVP	Live Picture (real-time photographic retouching)	£645.00
MCAD	MiniCad 6.0 (native professional 3D design & analysis)	£495.00
RYDS	Ray Dream Studio (3D design, modelling, animation)	£279.00
PHSP	PhotoShop 3.0 (special offer price - while stocks last!)	£325.00
PNTR	Painter 4.0 (the premiere painting program)	£299.00
STRV	StrataVision 3D (modelling, rendering and animation)	£159.00

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ACRA	Adobe Acrobat 2.1 (paperless publishing revolution)	from £110.00
ATM	ATM 3.8 (smooths screen and print fonts)	£39.00
CAIP	Click Art (2500 clip art images)	£39.00
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FTCH	Fetch (superb image database system)	£85.00
FNTG	Fontographer 4.1 (best professional font creator)	£299.00
PMKR	PageMaker 6.0 (power and ease of use 68k /PowerMac)	£379.00
QXXP	Quark Xpress 3.32 (the professional's choice)	£599.00
QXXZ	Quark Xpress 3.32 (Power Mac Native version)	£665.00
QK	Quark Xtensions (we carry a wide range)	please call
TYSL	TypeStyler (manipulates PostScript fonts)	£99.00

PRINTERS

ECS2	Epson Stylus Colour II (brilliant quality colour inkjet)	£315.00
ECSH	Epson Stylus XL A3 (A3 colour inkjet, non PostScript)	£895.00
HP34	HP DeskJet 340 (portable colour inkjet)	£225.00
HP60	HP DeskWriter 600 (superb new inkjet, Appletalk)	£219.00
HP66	HP DeskWriter 660C (colour and mono in one)	£289.00
HP85	HP DeskJet 850c(higher speed, 600dpi mono, 300 clr)	£375.00
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RDI20	Radius IntelliColour 20" Monitor	£1399.00
SN15	Sony 15" Trinitron Monitor CPD 15SF1	£359.00

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UVSA	Umax Vista S6 (with Photoshop LE)	£315.00
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COMMUNICATIONS

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SPR3	Sportster FaxModem (28,800 baud, BABT approved)	£189.00
SPEA	SupraExpress FaxModem (quality, low cost 14.4 baud)	£85.00
SPEB	SupraExpress FaxModem (quality, low cost 28.8 baud)	£145.00
SPRA	Supra FaxModem (top quality, Grp III 28.8 baud)	£185.00
TLPT	TelePort Platinum (28.8 modem from Global Village)	£240.00

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ANET	LocalTalk (AppleTalk) connector kits	£14.00
FTNP	PhoneNet connector kits	£12.00
FEHA	EtherLan Hub 9 (9 port ethernet 10baseT Hub)	£125.00
FRAD	Farallon AirDock (Infra Red LocalTalk connector)	£69.00
QKML	QuickMail 3.5 10 User (powerful flexible E-Mail)	£365.00
ASPA	AsantePrint (Ethernet to AppleTalk printer router)	£249.00
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MDRT	MacroMedia Director 4.0 (key multimedia tool)	£795.00
PRMR	Premiere 4.2 (Adobe's brilliant QuickTime editor)	£399.00
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DSMT	DOS Mounter Plus (read/write PC floppys from your Mac)	£55.00
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GPCA	PowerPort Platinum (PCMCIA 28.8 fax modem)	£449.00
TPCM	TDK Modem (PCMCIA 28.8 fax modem)	£225.00

ACCESSORIES

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TNxx	Toners/Ink Cartridges (for laser & inkjet printers)	call
KBCE	Extended Keyboard (15 function keys, numeric pad)	£49.00
QCKC	QuickCam (mono video camera for QuickTime)	£79.00
AGMJ	JetStick (joystick for the control you've always wanted)	£45.00
SESY	Security Systems (is your Mac vulnerable to theft?)	from £29.00
TMADD	Thinking Mouse (4 button with software)	£65.00
TMADB	Turbo Mouse (top selling trackball)	£75.00
WCU6	Wacom ArtPad II A6 (handy stylus and tablet)	£135.00
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VR256	256K VRAM Chips (adds more colours)	£19.00

FOCUS

A swift QuickTake picture

This new card offers both 10BaseT Ethernet and 16 bit video for the PowerBook 150 and 5300 family in a single compact product. Now you can drive an external monitor up to 17 inches in size at true 16 bit (thousands of colours) resolution. In addition it will give you 8 bit resolution (256 colours) on 20 inch monitors turning your PowerBook into a desktop publishing workhorse. By using this card, you can save money and save valuable PCMCIA slots.

DEALER INSTALLATION REQUIRED

LapisColor MV16 Video/Ethernet Card

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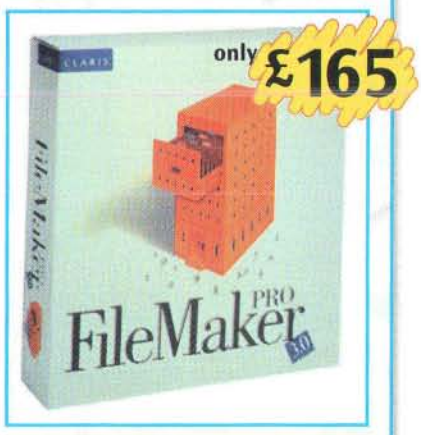
CLARIS

FileMaker Pro 3.0



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FileMaker Pro 3.0 Upgrade

only £89

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VR512	**512K VRAM Chips** (adds more colours)	£29.00
VR9A	**1Mb VRAM DIMM** (for 7200, 7500, 8500)	£69.00
VR9B	**2Mb VRAM DIMM** (for 7200, 7500, 8500)	£195.00

EDUCATION

UP TO 12 YEARS

AMAN	**Amazing Animation** (cool animation for kids)	£45.00
KDMH	**KidsMath** (takes kids from counting to arithmetic)	£29.00
KDPX	**KidPix II** (wonderful paint program with sound effects)	£29.00
NMBM	**NumberMaze** (award winning arithmetic tutor)	£35.00
RDMZ	**ReadingMaze** (letter recognition to sentences)	£35.00
SPLX	**Spelunx** (brilliant game-like learning environment)	£29.00

FROM 10 YEARS UP

DFMZ	**Decimals & Fractions Maze** (helps older kids)	£35.00
TYEN	**Typing Instructor** (good training from basics to touch)	£25.00
WIWD	**Where in World is Carmen DeLuxe** (geography based)	£29.00

PROGRAMMING

HYPC	**HyperCard 2.3** (new version, more power)	£95.00
CDWB	**Metrowerks Code Warrior Bronze v8** (680x0 compiler)	£95.00
CDWG	**Metrowerks Code Warrior Gold v8** (PowerMac compiler)	£265.00
ZCP	**Symantec C++** (best object oriented tool)	from £75.00
THKC	**Think C 6.0** (the leading Mac app development tool)	£185.00
THKP	**Think Pascal 4.0** (excellent developer level compiler)	£165.00
FTBS	**FutureBasic II** (the best Basic for Mac, includes PG Pro)	£179.00

UTILITIES

PRODUCTIVITY ENHANCERS, FILE & DISK MANAGEMENT

EASE	**At Ease 3.0** (secure Finder replacement)	£35.00
INVU	**Conflict Catcher 3.0** (INIT manager and more)	£55.00
NDBP	**DiskDoubler Pro** (DiskDoubler,AutoDoubler,CopyDoubler)	£60.00
HDTK	**Hard Disk Toolkit** (the best formatter and checker)	£125.00
MCTA	**MacTools Pro 4.0** (disk safety and protection utility)	£79.00
NUM	**Norton Utilities 3.2** (best selling utilities package)	£79.00
NOWU	**Now Utilities 5.0** (suite of essential utilities)	special
POPF	**PopUpFolder** (view folder contents with submenus)	£30.00
QCKY	**QuicKeys 3.1** (macro maker, time saver utility)	special
RAMD	**RAMDoubler** (actually doubles your available RAM!)	£45.00
SPED	**SpeedDoubler** (greatly improves performance)	£45.00
RASP	**RamDoubler & SpeedDoubler Bundle**	£69.00
SFDL	**Stuffit DeLuxe** (famous file compression program)	£65.00
SUIT	**Suitcase 2.14** (manage your font menus)	£49.00

PREVENTION & CURE DEPT.

OPDT	**DeskTape** (treats DAT as if it were a 2Gb drive)	£195.00
FLGD	**FileGuard** (serious protection for specific files)	£145.00
MAD#	**MacAdministrator** (secure all Macs on your site)	from £22.00
MPR1	**MacPrefect** (secures most aspects of the Finder)	£30.00
PRSB	**Personal Backup** (best value backup on the market)	£32.00
RTSP	**Retrospect 3.0** (most sophisticated archival backup)	from £129.00
SAM	**SAM 4.0** (Symantec's anti virus utility)	£55.00
VIRX	**Virex 5.63** (best virus tracer & eradicator of all)	£60.00

SCREEN SAVERS

AFDK	**After Dark 3.0** (famous screen saver with many modules)	£25.00
LTSS	**Looney Tunes** (famous cartoon screensaver)	£25.00
TTWDK	**Totally Twisted** (outrageous and irreverant)	£20.00

CD ROM

REFERENCE & EDUCATIONAL

3DAT	**3D Atlas** (simply wonderful)	£35.00
MAGCD	**Art Gallery** (Microsoft's tour of the National)	£39.00
ARTT	**Arthur's Teacher Trouble** (interactive story book)	£29.00
ARTB	**Arthur's Birthday** (more Arthur)	£29.00
BKSCD	**Book Shelf** (superb CD ROM for everyday reference needs)	£39.00
CRWRCD	**Creative Writer** (DTP for kids)	£25.00
CINI	**Cinemania 95** (19000 movie reviews and more)	£35.00
CIRCD	**Circus** (learn while playing with clowns and animals)	£29.00
DINO	**Dinosaurs** (the "must have" CD of the year)	£25.00

DRIVES and THINGS

STORAGE

only Quantum Drives used

CAPACITY	D2	APPLE	INTERNAL
800Mb	£209	£259	£179
1 Gig	£265	£315	£199
2 Gig	£570	£699	£555
4 Gig	£925		£825
9 Gig	£2199		

CE80	**d2 88Mb Syquest Drive** (inc cart)	£255.00
CE20	**d2 200Mb Syquest Drive** (inc cart)	£345.00
D2230	**d2 230Mb Optical Drive** (inc cart)	£439.00
D2DF	**d2 4/8Gb DAT Drive**	£879.00
CDMO	**Micronet 4x CD ROM Drive**	£199.00
R45C	**44Mb Syquest Cartridge**	£32.00
R80C	**88Mb Syquest Cartridge**	£35.00
R20C	**200Mb Syquest Cartridge**	£55.00
R12C	**128Mb Optical Cartridge**	£19.00
R23C	**230Mb Optical Cartridge**	£25.00
ZIPA	**Iomega ZIP Drive** (inc cart)	£165.00
EZ13	**Syquest EZ135 Drive** (inc cart)	£175.00
JAZA	**Jaz 1G Drive** (inc cart)	£459.00

STORAGE

NCRT	**Encarta '96** (fantastic multimedia encyclopedia)	£45.00
EOFCD	**Encyclopedia of Science Fiction** (a complete reference)	£29.00
FNARCD	**Fine Artist** (great fun paint program)	£25.00
GRME	**Grandma and Me** (delightful kids story)	£29.00
GRLCD	**Groliers Encylopaedia 95** (21 volumes, 9 million words!)	£39.00
HHHS	**Harry and the Haunted House** (the new best seller)	£29.00
KDPCD	**KidPix Studio** (KidPix plus animation)	£25.00
LLVCD	**Le Louvre** (tour the famous Paris Gallery)	£35.00
WTSCD	**Mr Wonder's Toyshop** (storytelling, music ,rhyme)	£25.00
MICD	**Musical Instruments** (Microsoft's excellent entry)	£25.00
MPCCD	**Monty Python's Complete Waste of Time** (not at all)	£29.00
OEDCD	**Oxford English Dictionary** (the whole thing on CD ROM)	£425.00
RUFF	**Ruff's Bone** (adventures with Ruff the dog)	£29.00
REDCD	**Red Shift** (superb astronomy program)	£39.00
STTM	**Star Trek Interactive Tech Manual** (tour de Enterprise)	£29.00
HARECD	**Tortoise and the Hare** (the epic race)	£29.00
UHBCD	**Ultimate Human Body** (Dorling Kindersly's one)	£39.00
WWCD	**Widget Workshop** (fun in a mad scientist's laboratory)	£25.00

ENTERTAINMENT

BEST-SELLING GAMES ON CD

1)	DOM2	**Doom II** (you may have have heard of this game!)	£35.00
2)	MRTHCD	**Marathon II** (can you resist?)	£45.00
3)	MYST	**MYST** (magical mystery adventure)	£35.00
4)	PRPCD	**Prince of Persia I & II** (two of the best games ever)	£19.00
5)	DKFCD	**Dark Forces** (brilliant game based on Star Wars)	£35.00
6)	PGA3	**PGA Golf III** (more challenging games)	£35.00
7)	SIMCC	**Sim City 2000 Collection** (with extra goodies)	£39.00
8)	MRTCD	**Marathon** (the best selling game even better on CD)	£39.00
9)	LEMC	**Lemmings Bundle**	£22.00
10)	ALRC	**Al Unser** (arcade car racing)	£22.00
11)	PLGDCD	**Links Pro Golf** (features network play)	£22.00
12)	DSCT	**Descent** (cross between Doom and Rebel Assault!)	£29.00

BEST-SELLING GAMES ON FLOPPY DISK

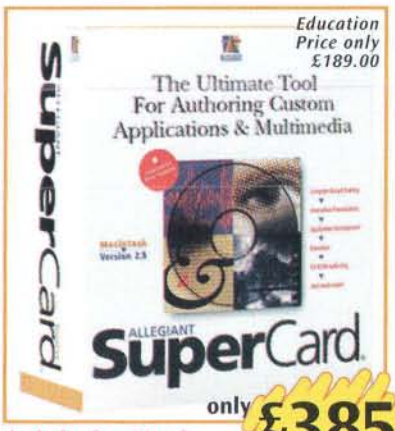
1)	SIMC2	**Sim City 2000** (design and run your own city)	£29.00
2)	A10A	**A10 Attack** (the best flight sim around)	£39.00
3)	FLSM	**Microsoft Flight Simulator** (realistic, accurate)	£35.00
4)	CHCH	**Chess Champion** (best Chess game)	£25.00
5)	ERIC	**Eric's Ultimate Solitaire** (a dozen patience games)	£35.00
6)	LEM3	**Lemmings/Oh No! More Lemmings Bundle**	£22.00
7)	BRDG	**Bridge** (not the Golden Gate but the card game)	£24.00
8)	ITG10	**10 Intelligent Strategy Games** (backgammon...)	£29.00
9)	F18K	**F/A18 Hornet** (Korean Crisis mission for F/A18)	£29.00
10)	F18H	**F/A18 Hornet** (from the creators of Helicats)	£49.00
11)	FSHB	**FlashBack** (science Fiction adventure)	£25.00
12)	SHNM	**Shanghai: Great Moments** (more Shanghai)	£29.00

NEW GAMES ON CD

ABSZ	**Absolute Zero** (furious pace action in space)	£29.00
ALDCD	**Alone in the Dark II** ("one hell of a sequel!")	£35.00
BRTM	**Buried in Time** (sequel to Journeyman Project)	£29.00
BRNCD	**Burn Cycle** (futuristic interactive challenge)	£29.00
FRKCD	**Frankenstein** (interactive story, you play the monster)	£35.00
FTHCD	**Full Throttle** (motorcycle madness)	£32.00
IFDCD	**In the First Degree** (play a murder prosecutor)	£35.00
SIMI	**Sim Isle** (control your own island)	£29.00

ALLEGIANT

SuperCard 2.5



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NEW GAMES ON FLOPPY DISK

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ALRD	**Al Unser** (arcade car racing)	£22.00
ISHD	**Ishido** (Chinese strategy game)	£22.00
TRZL	**Triazzle** (brain teaser from Berkeley Systems)	£19.00

BOOKS & TRAINING

BEST-SELLING BOOKS

1)	BK4075	**Mac Bible 5th Edition**	£29.95
2)	BK5010	**Internet Starter Kit Mac**	£27.50
3)	BK6035	**Quark Xpress Book 4th Ed.**	£29.99
4)	BK2180	**Macworld Photoshop V3.0 Bible**	£38.99
5)	BK4055	**Little Mac Book 3rd Ed.**	£14.99
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7)	BK2215	**Illustrator 5.5 Book**	£29.95
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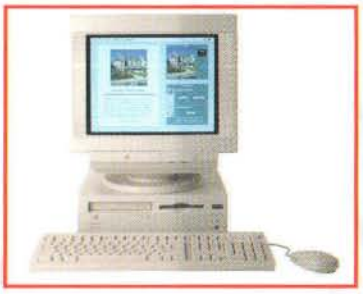

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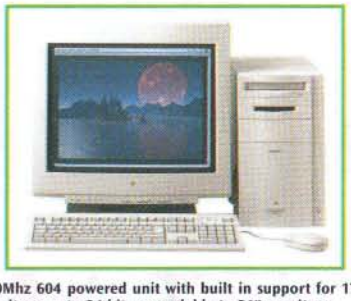

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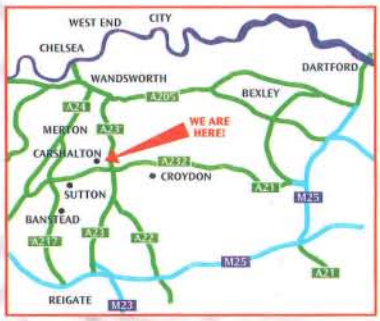

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reviews

MACWORLD RATING ✪✪✪✪✪/9.0-10.0 = EXCELLENT ✪✪✪✪/7.0-8.9 = VERY GOOD ✪✪✪/5.0-6.9 = GOOD ✪✪/3.0-4.9 = AVERAGE ✪/0-2.9 = POOR

Image manipulation

Live Picture 2.5

Publisher: Live Picture
Distributor: IMC (01753 830 999)
Price: £795; or, £995 with one day's training
Pros: Very powerful; excellent support for EPS
Cons: No pixel-level editing
Macworld Rating: ✪✪✪✪/7.7

xRes 2.0

Publisher: Macromedia
Distributor: Computers Unlimited (0181 200 8282)
Price: £549
Pros: Photoshop-like interface; powerful; direct mode allows pixel-level editing
Cons: Not yet a full Photoshop replacement
Macworld Rating: ✪✪✪✪/8.5

No matter how much Adobe enhances Photoshop, it has always remained a program that excels at photo-montage and retouching, but can be hard work when it comes to creating original artwork.

Photoshop has been around for something like six years now, and in that time it has become the industry standard for most photo-manipulation work on the Mac.

There's no 'de facto' about it; if you are going to edit images, you'll be using Photoshop. Indeed, most scanners now ship with the cut-down 'LE' version of the program for free.

Unfamiliar Picture
Unlike Macromedia's xRes 2.0, Live Picture 2.5 has an interface very different from Adobe Photoshop.

In order to use it to full effect you'll have to be prepared to go through a pretty steep learning curve – although nothing about the program is particularly obscure, it's different enough from most other Macintosh applications to have you scratching your head at times.

However, over the last 18 months or so, two programs have started to challenge Photoshop's dominance at the high-end of the market, where work often involves combining several large, multi-megabyte files into one finished image – a task that Photoshop, although perfectly capable, starts to struggle with.

The problem is simply the *size* of the images involved; even with a highly-specced machine, just scrolling around can become a real trial – let alone applying filters.

It's here that the two contenders to the throne come in. xRes, from Macromedia (which bought the original creator, Fauve, last year), and Live Picture, from (rather confusingly) Live Picture.

In contrast to Photoshop, when you're editing an image in either of these programs, you're not working on the file itself. Instead, you edit a screen-resolution version of the image. The actual file is only altered when you have finished work.

This may sound very limiting; after all, the screen is only 72 dots per inch (dpi), whereas most scanned images will come in at anywhere from 300 dpi to 3,000 dpi. However, the image you work on is 72 dpi at the required magnification – in other words, if you look at the image at 10 per cent, then zoom in to 400 per cent, you'll still see a 72 dpi version on screen.

Both xRes and Live Picture use their own file formats to store the image as it's being worked on: xRes' is called LRG, Live Picture's is IVUE.

After editing is complete, you will need to save the image as something more standard, such as a TIFF. That's when the actual processing of the original, high-resolution image takes place – so creating that TIFF can take a significant amount of time if you have a large original.

Z-z-z-zoom

One thing that will certainly take some getting used to in either package is the redraw that occurs whenever you zoom in on an image.

The first version of the graphic is very pixellated – it's just a true zoom of the current 72dpi view. This is then gradually replaced with a higher-resolution version of the graphic, but even on a high-end machine it can take several seconds for the whole screen to be redrawn.

On the other hand, this is still faster than using Photoshop to manipulate 500MB of data. And both Live Picture and xRes allow you to cancel the redraw at any time.

Compositing images

Live Picture 2.5 feels very much designed for comping together several large images and then adjusting the final version.

It is totally resolution-independent; you never really get down to editing individual pixels, and for that reason some people will feel that it does lack Photoshop's power.

On the other hand, its user interface and compositing features are similar to those found on high-end Unix workstations, and offer excellent control over an image.

Version 2.5 of the program offers a number of new features; probably the most interesting are the support for Photoshop plug-ins, and the ability to import and manipulate EPS images.

The former is very much a 'me to' feature these days: you don't have a credible graphics package unless it can handle Photoshop filters. The EPS

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Macromedia xRes 2.0, page 70
Live Picture 2.5, page 70
Adobe Illustrator 6.0, page 72
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handling, though, is certainly very significant.

Rather than just importing the PICT preview, and not allowing any manipulation other than basic resizing, Live Picture deals with the whole EPS; you can distort it to your heart's content, and it will still remain resolution-independent until final output (where you specify the resolution of the output file). You can't actually paint on the EPS layer of the image, but that is a relatively minor restriction.

xRes looks and feels far more like Photoshop. Indeed, it actually offers two modes of working: the Live Picture-like 'xRes mode', where any adjustments to the image are made after editing is finished; and Direct mode, where the pixels are processed in real time – just like Photoshop and other graphics packages.

xRes also has a 'floating filter preview': while a filter dialogue box is open, you can drag a smallish rectangle around on the main image to see what the filter's effect will be.

xRes includes several 'natural media' painting tools and textures, which in some ways make it more a competitor to Fractal Design's excellent Painter.

Brushes (see above right) include felt-tip, oil, charcoal and Caligraphy. Textures work in conjunction with the brushes to create the effect of drawing on natural media such as paper, canvas and so on.

Because it's a Macromedia product, there is good integration with FreeHand: artwork can be imported into xRes to create selections, masks, or new 'floating objects'. It supports Macromedia Xtras, and will work with Photoshop filter plug-ins while in Direct mode. It's also a cross-platform package: a PC version is imminent, while Live Picture's PC version is not expected for a few months.

Both Live Picture and Macromedia are keen to stress that their products are 'companions' to, rather than replacements for, Photoshop. However, the fact that both now support Photoshop plug-ins means the boundaries are becoming seriously blurred.

Looking at the way the programs are going. While Live Picture will, indeed, probably be a companion program for some time to come, xRes is moving very close to the stage where it will be a direct competitor, as well as a good solution for very large images.

Live Picture is developing an OPI (open pre-press interface) server that will run on Silicon Graphics machines and will support its IVUE format, for high-speed final image creation on a separate machine. It is part of the company's attempts to get its IVUE format recognised as an industry standard. Its specifications will be opened up to other graphics program developers at the end of the year.

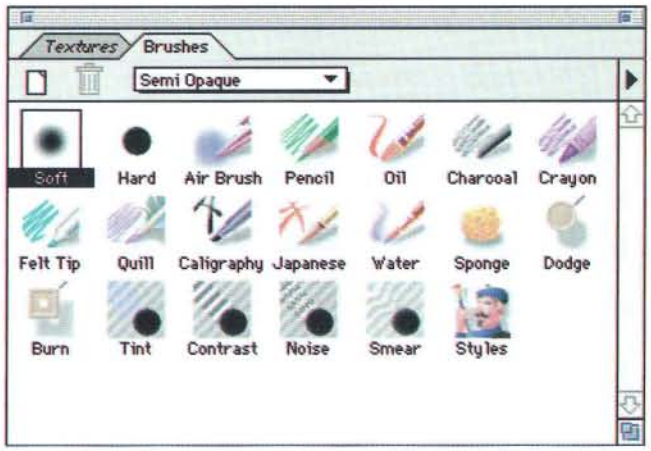
The last word

xRes, on the other hand, has Macromedia's not inconsiderable marketing strength behind it, and has the advantage of being able to edit images down to pixel level. The fact that it also includes natural media tools and has a more familiar user interface means that it gains the edge slightly for many jobs, although Live Picture 2.5 does include that excellent EPS import facility.

If you are dealing with very large images, neither program will disappoint.

Which one you choose depends very much on the specific jobs you will be performing. For compositing many large images, we feel that Live Picture 2,5 has a slight edge; but if you want one package for both small and large files, and need to be able to edit individual pixels, Macromedia's xRes 2.0 is probably the one for you.

– Ian Wrigley



Looks like Photoshop
Most people will already have used Photoshop before they come across Live Picture or xRes, so any similarity in terms of user interface will be a bonus – and that's where xRes certainly has the edge.

The new version, 2.0, has clearly been designed to make the transition as easy as possible – anyone familiar with Photoshop should find most features easy to use (left).

Macromedia has introduced features such as configurable tool palettes very similar to Photoshop's – you can drag-and-drop individual tool settings to create your own palettes containing just the features you need most often.

This is a good thing, since the number that appear when you first launch the program is somewhat daunting – even on a 21-inch monitor, there's precious little room for the image if you have all the palettes visible.

At the top of the screen there is a toolbar (top), which offers many standard functions at the click of the mouse – at first glance, this makes the program look more like a Microsoft application than anything else!

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Drawing Software

Adobe Illustrator 6.0

Publisher: Adobe Systems
Distributor: Principal (01706 832 000)
Price: £320
Pros: Improved file-import capabilities; drag-and-drop between Illustrator and Photoshop; supports Photoshop-compatible filters; revised shape-creation tools; curve fitting for better distortions
Cons: Inefficient image handling; clumsy blending and tracing; knife tool has problems.
Macworld Rating: ✪✪✪✪/7.1

Six appeal
Illustrator 6.0 provides better gradients, masking, guidelines, and transformation capabilities in addition to shape-creation tools, curve fitting and Photoshop support.

Don't let the version number fool you: Adobe Illustrator 6.0 is not a dramatic upgrade. In fact, it may be the least substantial full upgrade in Illustrator history. The core program remains virtually unchanged since version 5.5, with modifications restricted almost exclusively to plug-ins.

Even so, if you're a true-blue Illustrator user who'd rather eat rocks than switch to Macromedia FreeHand 5.5, then you'll want to upgrade to Illustrator 6 as soon as possible. The enhancements are few in number, but they eliminate many of the headaches associated with previous versions.

Except for a minor gradient hiccup in version 5.0, printing from Illustrator has always been extremely reliable; now it's easier to use. You can print colour separations directly from Illustrator 6.0 without resorting to the Separator utility.

If you encounter PostScript errors (such as limitcheck), you can convert gradients into blends, and tile patterns into objects, using the new Expand command.

These enhancements are hardly exciting – in a perfect world, Illustrator would have always offered such options – but they make printing less of a nuisance.

Tagging TIFFs

In 1988, FreeHand 2.0 introduced support for TIFF images. More than seven years later, Illustrator follows suit. In fact, Illustrator has gone positively nuts in the compatibility department, importing or exporting a total of 15 file formats, including Kodak Photo CD, JPEG, and flattened Adobe Photoshop 3 images.

Best of all, Illustrator 6.0 includes a new EPS parser that lets you open drawings created in FreeHand and other programs. I was able to open every illustration I tried, including a few that contained imported images and custom PostScript fill patterns. Only text proved a problem, sometimes breaking into hundreds of separate blocks.

But while Illustrator's TIFF support comes as welcome news, its implementation suffers. Where FreeHand wisely tags TIFF files on disk – the T in TIFF stands for tagged, after all – Illustrator imports every pixel and converts the image into its internal PostScript format. This means more work for Illustrator and more waiting for you.

For example, I imported two Photo CD images into both FreeHand 5.5 and Illustrator 6.0. In FreeHand, it took a few seconds to import the images, and the completed illustration consumed 33K on disk. In Illustrator, it took a whopping 14 minutes to import the images, and the finished illustration consumed 44MB – more than 1,000 times the drive space that the FreeHand file took.

FreeHand speeds up screen redraw by letting you control the on-screen resolution of an imported TIFF image, making screen redraw nearly instantaneous; Illustrator lacks image-redraw controls and at times is unbearably slow.

On the other hand, Illustrator wisely tags EPS images on disk and imports just the PICT preview, so if you want to import large images, you're better off sticking with the EPS format, just like in the old days.

Illustrator to Photoshop

Since the overwhelming majority of Illustrator artists also use Photoshop, Adobe Systems has built a virtual bridge between the two.

You can now drag objects from Illustrator and drop them into Photoshop. Photoshop rasterizes the objects on the fly according to the resolution of the image window, so higher resolutions yield more pixels. You can likewise drag images from Photoshop into Illustrator, but only at 72 dpi.

You need System 7.5 and lots of memory (at least 32MB) to take advantage of drag-and-drop, but to its credit, Illustrator relies on the Macintosh's native drag-and-drop functions, rather than infesting your system with Microsoft OLE (as its sibling Adobe PageMaker does).

You can also rasterize objects directly within Illustrator, lift colours from pixels using the eyedropper, and apply Photoshop-compatible filters to imported images.

Illustrator supports a wider range of Photoshop filters than FreeHand does, including the external filters that ship with Photoshop. The one caveat is that you cannot apply a filter to a tagged EPS image, so you have two choices: either import an image in its entirety and retain the option to filter it, or tag the EPS file on disk and do without filters. There is no need for such a trade-off in FreeHand.

Plug-ins come of age

In version 5, Adobe opened up Illustrator to third-party plug-ins. To get the ball rolling, Adobe threw in a few plug-ins of its own. Illustrator 6.0 expands plug-ins, permitting them to appear as commands or tools.

Where you once had to choose commands and enter numerical data to create polygons, stars, and spirals, you can now drag with tools. Illustrator equips the tools with lots of tricks, allowing you to add sides to a polygon or modify the twist of a spiral as you draw the shape. These are some of the best tools for creating primitives (simple shapes) that I've seen.

Version 6.0 also adds curve fitting, which lets Illustrator distort paths accurately. For example, where the old Twirl filter merely moved points around, the new Twirl command adds points intelligently and bends segments with mathematical

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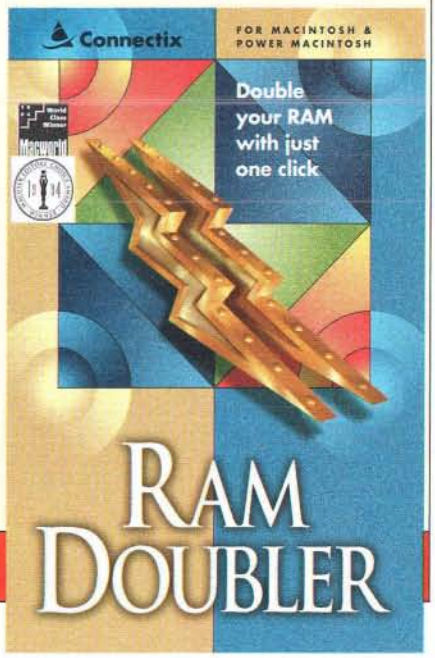

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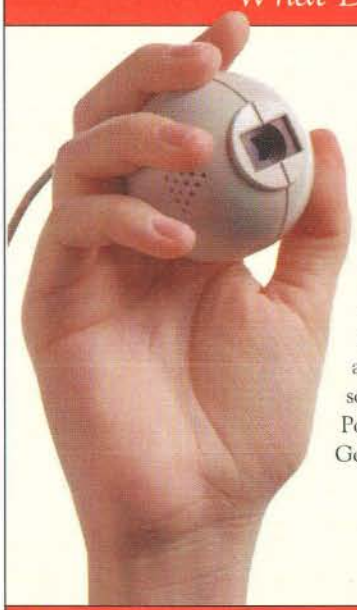

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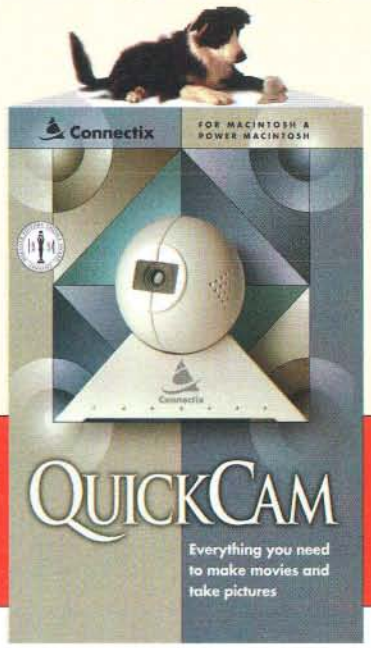

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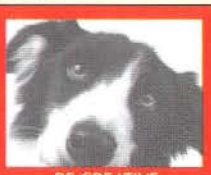
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precision. Only a handful of Illustrator's commands take advantage of the new curve fitting, but this feature should be a boon to third-party plug-in developers that do not include curve-fitting capabilities of their own.

Other plug-in improvements include a floating palette of alignment and distribution options and a Control palette for quickly moving, scaling, and rotating whole objects. A new Path Pattern filter lets you apply specially constructed tile patterns to the stroke of a path. Illustrator can stretch and bend the tiles (again using curve fitting) so that the tiles follow a path's twists and turns like diamonds along the back of a rattlesnake.

The knife function – implemented both as a tool and a command – is the rotten apple in the new crop of plug-ins. Designed to create freeform slices through filled objects, it seems to have missed the testing cycle. The knife has a habit of deleting unfilled paths, particularly closed ones. You can spare unfilled paths by pressing the control key, but this essential trick goes undocumented. And a documented technique for duplicating sliced paths by double-clicking on the knife tool icon doesn't work.

FreeHand stands tall

When all is said and done, FreeHand 5.5 retains a few key advantages, especially in the realm of blends. Illustrator's reliance on a tool instead of a command makes blending more cumbersome than it should be; the blend function is notorious for generating errors if you don't click according to rigid specifications; and Illustrator can't redraw blends when you move, edit, or recolour shapes.

Illustrator's autotracing function is similarly inferior. Despite Illustrator 6.0's support for a multitude of image formats, black-and-white tracing templates are limited to PICT or MacPaint formats.

You can't adjust the template after importing it, and Illustrator can trace only one path at a time.

FreeHand also continues to be the faster program, especially where text and imported images are concerned. FreeHand lets you mix page sizes in one document, automatically advance from one page to the next, and zoom and scroll with far more precision.

And perhaps most important, only FreeHand 5.5 exists on both platforms. Illustrator for Windows has stalled at version 4.1, essentially the equivalent of Illustrator 3 for the Mac.

The last word

Illustrator does offer its share of advantages. Even FreeHand devotees admit Illustrator's pen tool is a work of art. Illustrator also provides better gradients, masking, guidelines, and transformation capabilities in addition to shape-creation tools, curve fitting, and Photoshop support.

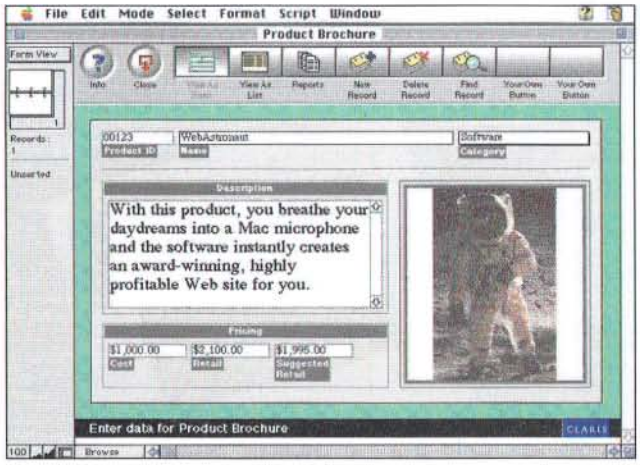
But the plain fact is that FreeHand has made more progress in the last two years and is set to continue moving aggressively into Illustrator's territory. If FreeHand doesn't interest you, then the changes in Illustrator 6 justify the £99 upgrade cost. But if you're on the edge, give FreeHand 5.5 a serious look before making your decision. **– Deke McClelland**

Database Software

BUSINESS

FileMaker Pro 3.0

Publisher: Claris (0181 756 0101)
Price: £199
Pros: Large collection of powerful templates; World Wide Web capabilities; easy to learn and use.
Cons: Minimal SQL connections; slow flat-file searches; limited programming and scripting.
Macworld Rating: ✪✪✪✪/8.0



Get what you want
You can set up a product catalogue quickly with the appropriate FileMaker template, and with a little script engineering you can make the catalogue a Web site.

FileMaker Pro has developed an outstanding reputation over the years as a database for mere mortals, not just programmers. Year after year, it has scored well with end users, more on the strength of its usability than on its power. Building on this legacy, FileMaker Pro 3.0 offers improved ease of use and a power boost.

The simplest database is a two-dimensional table, much like a spreadsheet. The simplest sort of relational capability is to look up data in one of these tables and add it to another table. In a relational link, two columns with the same information in two different tables – a column of Social Security numbers that appears in a table of employee salaries and in a table of employee home addresses, for example – are used as the lookup connection between the tables.

With clever design, you can arrange a relational database to contain little redundant information, so that large multi-table business databases become much more compact than they would be if everything were stored in a single table.

Earlier versions of FileMaker could perform a limited type of relational lookup; 3.0 is a fully relational database, supporting both one-to-one and one-to-many links, a dramatic improvement for users with more challenging database needs.

To implement table linking, FileMaker Pro 3.0 uses a spartan dialogue box rather than the fancy graphical mapping found in competing packages, but it works well enough for the typical small-business environment.

The big easy

The new relational capabilities are great for FileMaker developers, who usually generate the most complex FileMaker applications. But for nonprogrammer end users looking for easy database solutions, the templates provided on CD will be the biggest news in this release. A group of 23 business templates covers everything from asset management to time cards, with professional-quality expense-control systems, personnel databases, and inventory/accounting software. The eight education templates run from

continues page 76

the obvious (student records) to the adventurous (a nifty Field Trips template), and the 13 home templates include one for recipes, a wedding planner, a medical-records keeper, and a check tracker that resembles a mini-Quicken.

You can easily take all of the templates apart and rebuild them to your heart's desire in FileMaker's Layout mode; a first-time user can remake templates into a custom application in a single afternoon using only the information in the built-in tutorial. This sort of simplicity is the main reason for FileMaker Pro's popularity in the Macintosh small-business-database market.

Nothin' but Net

FileMaker Pro 3.0 supports TCP/IP and IPX networking protocols, and includes instructions for using AppleScript to set up your FileMaker database on the World Wide Web. You can use this capability to set up a database of URLs in a sort of special-interest, roll-your-own Yahoo-type site, or use the Product Brochure template and the FileMaker Events URL suite to open your own retail Web site.

Once you have your catalogue on the Web, you can easily modify it by adding or deleting records in the traditionally easy FileMaker way.

FileMaker Pro is aimed at small and medium-size businesses interested in efficient database solutions, and its programming capabilities are limited compared with those in competitors like ACI US's 4th Dimension (see Reviews, March 1996), Blyth's Omnis 7, or Microsoft FoxPro.

Claris greatly expanded the scripting command set from previous versions, and it's still possible to work wonders with third-party script extenders such as Power Agent. But even with its improved scripting and third-party options, FileMaker's capabilities can't compare with those of a real programming environment that has a proper debugger. FileMaker Pro isn't as fast as competitors at searching large flat files and offers minimal connections to the venerable, large-company world of SQL databases.

The last word

Even these few drawbacks pose no great threat to FileMaker's popularity. FileMaker 3.0's developers aimed squarely at the future rather than offering a backward path to legacy data in large corporate databases. As a result, FileMaker Pro delivers a generous assortment of templates and provides a way to put databases on searchable World Wide Web sites.

For most small businesses, a fast way to post catalogues and other company information to the Web is a more significant database capability than improved programmability, a C-language interface for code resources, blinding flat-file search speed, or a SQL interpreter. And with FileMaker's price below £200 and upgrades for £99 from any existing versions or competitive upgrade, even the smallest enterprise can afford to make the investment. One grumble, though: Claris's pound-for-dollar conversion – Filemaker Pro costs just $199 in the US.

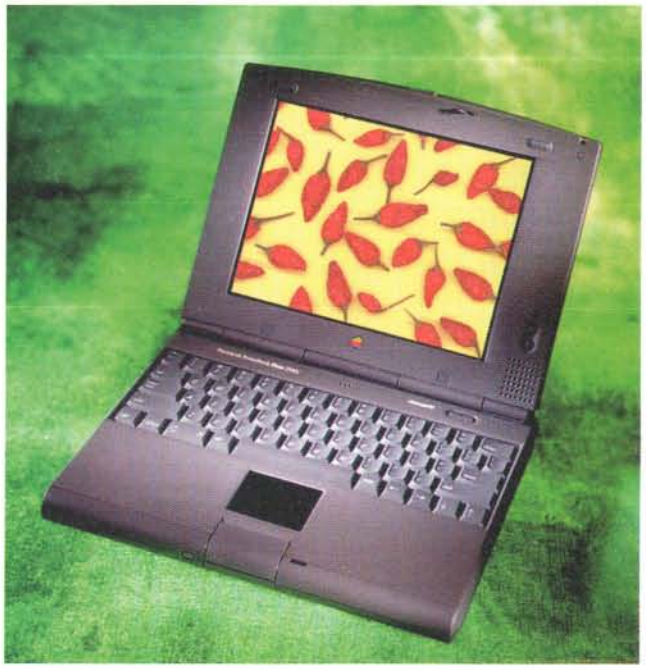
For the growing midrange of Mac database users – neither simple list-keepers nor users who need Oracle-like high-end capabilities – FileMaker Pro 3.0 is an ideal program. It's easy to learn, easy to use, and provides a comprehensive assortment of tools for common database tasks. **– Charles Seiter**

Portable

HARDWARE

PowerBook Duo 2300c

Manufacturer: Apple (0800 127 753)
Price: With 8MB of RAM and 750MB hard drive £2,530; with 20MB of RAM, 1.1GB hard drive, and 14.4Kbps fax modem £3,300.
Pros: Entry-level business-Mac performance in a small, lightweight package; good-size, crisp display.
Cons: Pricey; requires a variety of add-ons to exchange files and work with peripherals.
Macworld Rating: ✪✪✪/5.9



The first PowerPC PowerBook Duo
Fast, sophisticated and curvy.

The newest Mac subnotebook, the PowerBook Duo 2300c, would be the perfect accoutrement for James Bond's new BMW Z3 Roadster: fast, sophisticated, and curvy. Although it has the same sleek lines as the 200-series Duo, the 2300c offers a larger screen – 9.5 inches to the 200's 8.4 – and a touchpad that you can double-click to select items. Still, the 2300c's real allure lies not in its more obvious charms, but in the 100MHz PowerPC chip inside.

The megahertz rating is admittedly misleading – it's only a 603e, after all – but this 4.8-pound Mac is as fast as a desktop Power Mac 6100/60.

Portability... at a price

Speed and light weight generally come at a price, however, and this Duo is no exception. The model I reviewed sells for £3,300 and comes with a 14.4Kbps Express fax modem, 20MB of RAM, and a 1.1GB hard drive – a powerful system, even with the slow modem. (For £800 less, you can get a 2300c with 8MB of RAM and a 750MB hard drive.)

That's as expensive as the twice-as-fast Power Mac 8500, and it doesn't include such niceties as spare batteries or docking stations or floppy drives. Of course, you can't balance an 8500 on your knee or tuck it under your arm, but let's face it: this Duo is expensive. A comparable PC subnotebook with a comparable processor (a 75MHz Pentium, 100MHz DX4, or 100MHz 586) runs about £1,000 less than the 2300c.

I enjoyed using the 2300c.

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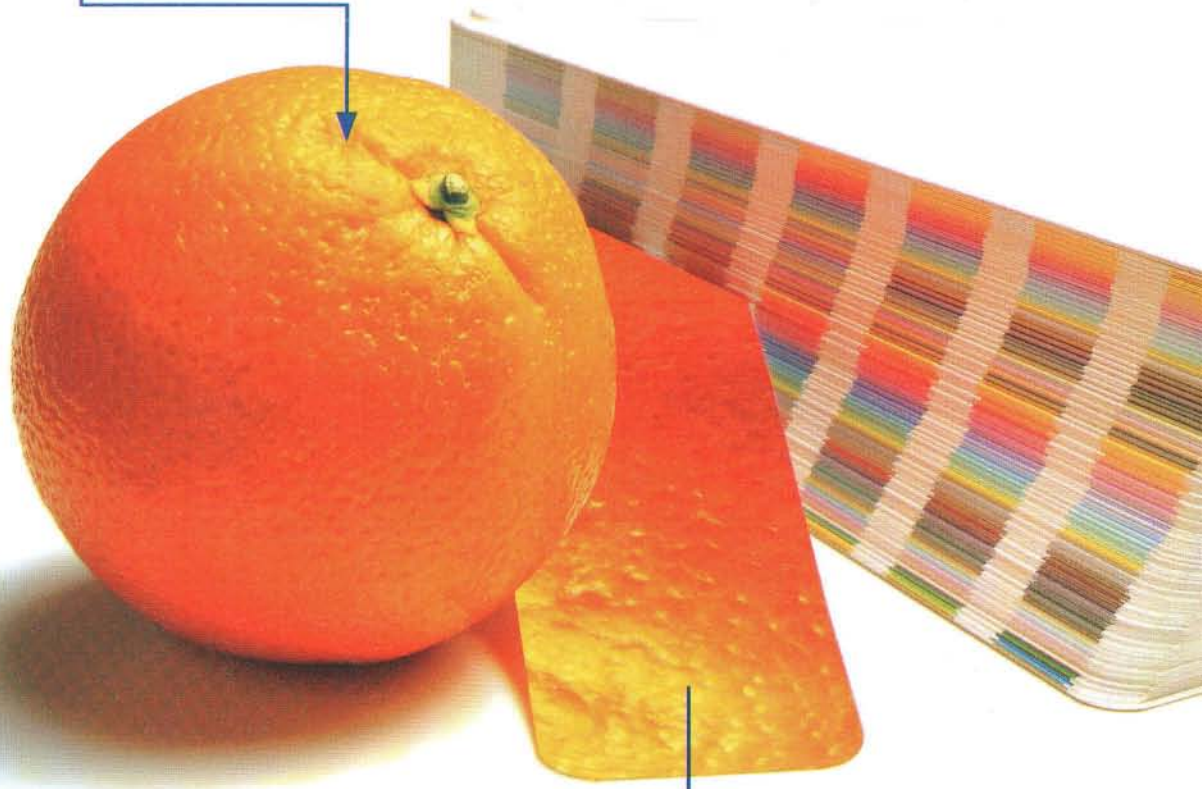

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We know how frustrating it can be when you just can't rely on your monitor to display colours accurately. What looks right on screen might not make the grade when it's on paper. That's why publishers, designers, photographers, printers and pre-press houses use Radius PressView. They now proof on-screen – meeting those ever-pressing deadlines – confident that, with PressView, their colour-critical work, like scanning, colour correction and image manipulation will be *The Perfect Match*.

PressView is a complete proofing system that works with all colour management systems, including ColorSync 2.0. It consists of a choice of 17" or 21" monitor, calibrator, powerful, easy-to-use software and a range of accessories to eliminate the distractions that can affect colour perception. You can control everything from custom white point and gamma settings to monitor geometry and save different settings for each job to share them with colleagues in other locations which allows you to work or proof together. It is the only system capable of calibrating to a 30-bit colour space – providing a palette of over a billion colours* – for the ultimate in colour accuracy.

To arrange a demonstration of *The Perfect Match*, please call **01483 772773.**

RADIUS

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Its performance is equal to an entry-level business Mac's and about 60 per cent faster than that of the 280c, previously the top-performing Duo.

With the right assortment of Apple docking stations, the Duo adapts to almost any environment. A £79 Floppy Adapter lets you attach an external floppy (£90) or CD-ROM drive (about £250 from big companies like Apple and NEC Technologies) and an external input device; a dock provides other Mac ports, including those for ethernet connections and external display. (The Duo 2300c has only a serial port if no dock is attached.)

The 2300c's large, crisp active-matrix screen is easy on the eyes, and the text is quite readable; that extra inch makes a noticeable difference.

And even devout mouse users will find the touchpad easy to adjust to and more natural to use than a TrackPad with a separate button. But I'd forgo the Express modem for an external model, even though that would incur the hassle of providing a power supply – 14.4Kbps simply doesn't cut it for Apple Remote Access, and navigating online services or the Internet is merely adequate at that speed.

The last word

The Duo 2300c is a fine subnotebook. Given the poor reception of ultralight portables on the PC side, it's nice that Apple remains committed to its subnotebook line despite the small target market. Yes, the price is high, especially when you begin outfitting the system with docks and peripherals. And yes, I wish there were a simple way to add an infra-red port.

Overall, the 2300c is a decent system that will appeal to Duo devotees; for them, the 2300c is a no-brainer. (If you own a 200-series Duo, you can replace the motherboard with the 2300c's Copland-ready, 603e board when it eventually is made available in the UK.) The rest of us will probably have the same reaction to the 2300c as we had to the BMW Z3: a longing look before we get back into our Volvos. – **Galen Gruman**

MW LAB

Duo 2300c holds its own against the 5300

Like the 5300, the newest Duo has a PowerPC 603e with a clock speed that triples that of the 68040 chip it replaces. Also like the 5300, the 2300c barely doubles the 280c's performance since factors like hard-drive speed, video display, and bus architecture diminish the 603e's speed. – **Macworld Lab testing supervised by Danny Lee**

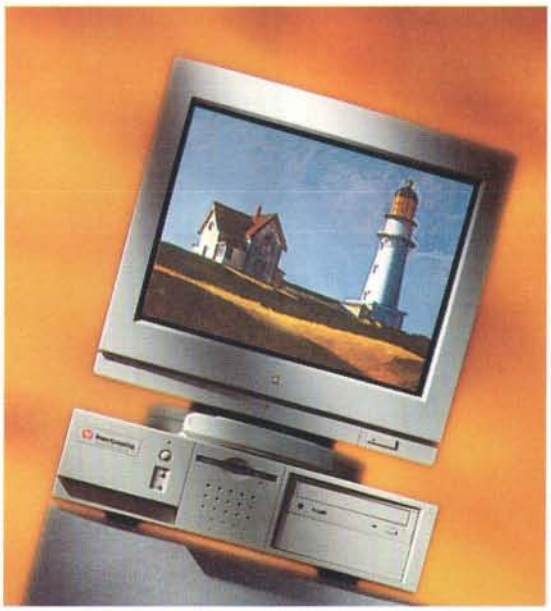
Longer bars are better. Results are times as fast as a PowerBook 520c (520c = 1.0). Products listed in decreasing order of performance.

MacOS-compatible System

HARDWARE

PowerCurve 601/120

Manufacturer: Power Computing
Distributor: Computer Warehouse (0171 724 4104)
Price: Base model £1,699; as tested £2,099
Pros: Fast; moderately priced; accessible case for upgrades; good software bundle.
Cons: No built-in AV capability; no memory interleaving; cannot use StarGate NuBus bridge.
Macworld Rating: ●●●●/7.5



Curve story
Power Computing comes up with another winner with its midrange PowerCurve MacOS-running clone.

Fresh on the heels of its powerful yet inexpensive PowerWave 604 series, Power Computing has introduced a system that beats Apple's business desktop standard – the Power Macintosh 7500/100 – in both performance and price, while offering nearly identical capabilities.

You'll save money buying a PowerCurve, but not tons. A solid professional-level system should include a 1GB hard drive, 16MB of RAM, a 256K cache card, a 4x CD-ROM drive, 2MB of video RAM, and a keyboard. In this configuration, Apple's 7500/100 costs about £2,400 with a third-party extended keyboard, while Power Computing charges £2,099 – a saving of £300. Power Computing skimps a little to give you that saving but also adds a couple of features Apple doesn't offer.

Losses and gains

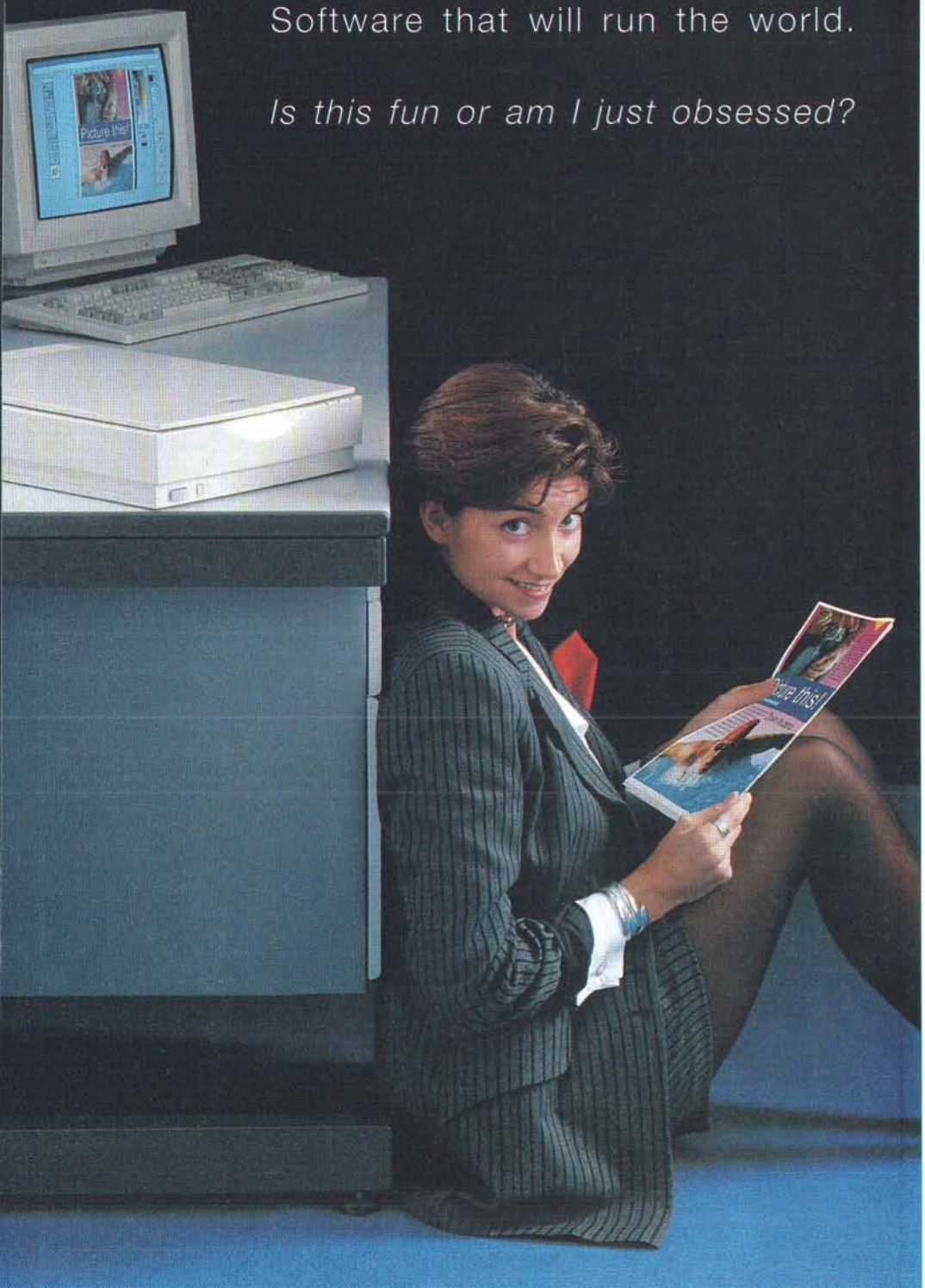
Unlike the 7500, the PowerCurve lacks memory interleaving, a design that boosts performance by about five per cent when two adjacent DIMM slots contain same-capacity, same-speed RAM.

The PowerCurve doesn't offer the 7500's basic video capabilities, either. Most people don't need AV technology, but for those who do, Power Computing offers or a £279 ATI MM card for the high-end multimedia user.

continues page 78

I like my ideas in print, not oblivion. I want the whole picture because my mind sees whole pictures. Images so real, they dance off the page. Powerful scanning helps me push the limits. Ultra high-res. Speed. Software that will run the world.

Is this fun or am I just obsessed?



Avoid input deprivation.

Epson GT colour scanners make other desktop flatbeds look flat and desky. Images are razor-sharp. Text enhancement lifts characters even from printed backgrounds.

The NEW 2400dpi* GT-5000, at just £350†, is priced for everybody and is the fastest, best-featured scanner in its price range. It joins two other GT award-winners: the 3200dpi* GT-8500 at £540† and the 4800dpi* GT-9000 at £630†.

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Some of the initial PowerCurves don't offer a power outlet for your monitor. Although I consider this a minor shortcoming, a number of readers complained that I didn't point this out in my review of the PowerWave 604 series (see Reviews, February 1996). Power Computing claims that it's fixing this glitch and that all PowerCurves will offer this "convenience outlet" by spring.

Unlike PowerWaves, PowerCurves offer no option to add NuBus cards. Power Computing's StarGate riser card – which lets you install two NuBus cards and two PCI cards rather than the standard three PCI cards – won't be offered for the PowerCurve.

There's some compensation for these drawbacks, though. Besides the £300 savings, you get a slightly faster system: Macworld Lab tests show that the PowerCurve is 3 per cent faster than the Power Mac 7500/100. As is typical of Power Computing systems, adding PCI cards, cache, RAM, and VRAM to the PowerCurve is easy, thanks to a case design that's more accessible than the 7500's.

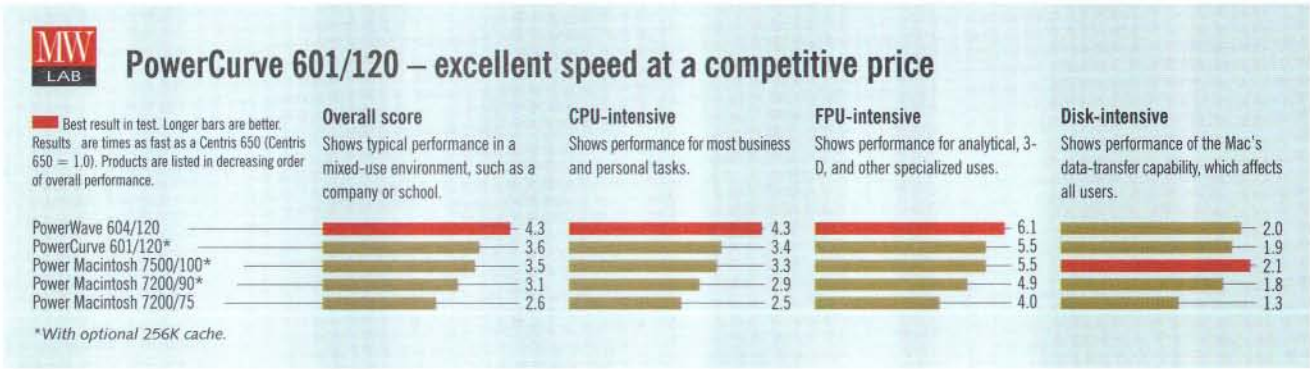
If you're a recent convert and don't have Macintosh software already, you'll find real value in the PowerCurve's bundled applications, which include ClarisWorks 4.0 and other useful extras. You'll also appreciate the videotape that walks you through your new system.

The low-profile PowerCurve case lets you install two internal drives, and one of the bays can handle removable media, just as in the 7500. Power Computing plans to offer a full-size desktop case with four internal drive bays within a few months. Initial UK shipments will not include the internal Zip drive option offered with the PowerWaves. But Zips are a likely option after spring.

Power Computing says the PowerCurve's CPU is upgradable, and indeed the 120MHz PowerPC 601 comes on a removable card. But the company doesn't yet have Apple's permission to release a faster CPU card based on the PowerPC 604. I tried using the CPU cards from a PowerWave and a Power Mac 8500, but they don't function in the PowerCurve, so you can't get around the uncertainty by betting on today's alternate solutions.

The last word

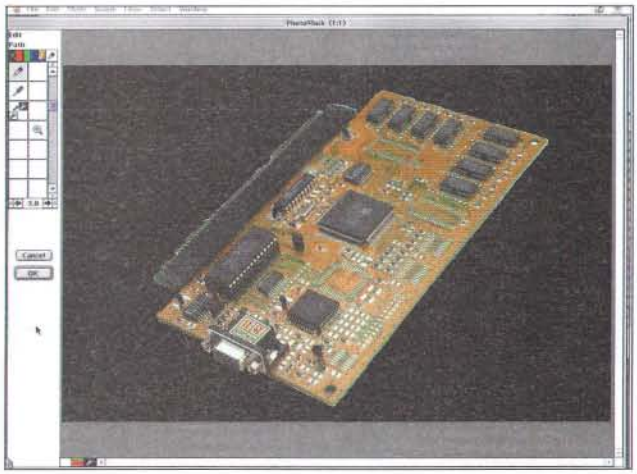
The PowerCurve 601/120 performs as well as any other PCI Power Mac, and for most buyers there's no clear-cut reason to choose one over the other. Buyers who are new to the Mac will like the bundled software, but for the rest of us, it's a toss-up. – **Galen Grumen**



Photoshop plug-in

PhotoMask

Publisher: Graphic Technology Basis
Distributor: Dainippon Screen, (0181 205 1213)
Price: £550
Pros: Fast, accurate masking facilities; paths easy to draw
Cons: Price; Awkward interface and manual make it difficult to learn
Macworld Rating: ●●●●/7.4



Mask of depth
The ability to zoom in and switch between three different view modes lets you create accurate masks and paths.

Selecting objects or creating paths is a tedious but essential task when manipulating images. Photoshop and other image editing packages offer a number of powerful features to help you along, but PhotoMask is designed to make the job a lot easier. It installs into the plug-ins folder and when selected from the Filter menu a full size window appears with a proxy of the image and a toolbar on the left. PhotoMask offers two separate modes – masking and path tracing.

Masking works very much like the magic wand in Photoshop, only it is much quicker to use. The standard procedure involves the use of the eye-dropper to sample the background colour.

Unlike Photoshop, the sensitivity to colour changes can be adjusted at any time using a slider so that an approximate mask is found. The other tools then allow you to accurately add or remove areas from the mask by using the eye-dropper again, this time restricting its effect to specific areas. An eraser and pencil are also available to make final corrections along with quick grow and shrink icons. You are free to zoom in and out and scroll around the image so accuracy is not a problem.

Path tracing uses a clever trick called semi-auto mode.

continues page 82

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And for presentation graphics and A4 proofing there's the S3600PS at £5995 - equally good value where a smaller format is needed.

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When enabled, paths snap to the edges of objects automatically, greatly easing the process. This works by finding borders between different colours or sudden changes in brightness and as in the mask mode, sensitivity can be adjusted. The semi-auto mode can be disabled when working with complex images. There are various options, including a choice between straight lines and three types of Bézier curves and a useful choke and spread slider.

Paths can be converted to masks and vice versa and although PhotoMask cannot import Photoshop masks, it does have a recover option should you need to re-edit the path or mask.

The last word

PhotoMask is a very powerful tool. Whether the rather high price tag can be justified is another matter. The user interface is awkward and takes getting used to. There is no online help and the manual is both terse and illegible in parts. Once you have mastered the program you will undoubtedly find it invaluable – it is fast, clever and reliable. – **Ofir Gal**

Scanners

HARDWARE

PowerLook II

Manufacturer: Umax
Distributor: Computers Unlimited, (0181 200 8282)
Price: £2,945 (£3,495 with transparency adaptor)
Pros: Friendly and flexible software; can be shared over a network
Cons: Inaccurate colour-matching plug-in
Macworld Rating: ●●●●/8.1

Saphir

Manufacturer: Linotype-Hell (01242 285 000)
Price: £3,250
Pros: Superb colour matching
Cons: Simplistic software; lacks basic image controls
Macworld Rating: ●●●●/8.8

(Top) Umax's PowerLook II (Bottom) Linotype-Hell's Saphir scanner

Two new A4 flatbed scanners from highly regarded manufacturers have just been launched. The Umax PowerLook II is an eagerly waited follow-up to the successful original. The Linotype-Hell Saphir, on the other hand, is the company's first entry into this level of the market – other models are in the five-figure range.

Curiously for two competing products, there's not much difference between the two scanners as far as the hardware goes. In fact, both scanners are made by the same manufacturer and the real differences are to be found in the software and its colour correction capabilities.

Both scanners feature an optical resolution of 600-x-1,200 dpi and 36-bit resolution. The scanners can take reflective material up to A4 and transparencies ranging from 35mm to 5-x-4 inch.

The PowerLook model can automatically detect the mounts and crop the image for you, while on the Saphir this has to be done manually. Both scanners include 25-pin and a 50-pin SCSI ports and a SCSI ID selector. The Saphir comes with a transparency adaptor as standard, shipped already fitted to the scanner. The adaptor is optional on the PowerLook II.

Plug and play

As you'd expect, the scanners come with a range of software, including Photoshop-compatible plug-ins that let you scan directly from Photoshop or similar applications.

The Saphir CD-ROM boasts a collection of QuickTime tutorials, but more importantly LinoColor Lite and ColorSync 2.0. If you have tried using the ColorSync version that came with System 7.5 you may not be impressed, but version 2 is worth checking out. It performs miracles when used with the Saphir and the correct profiles. Two ColorSync profiles take care of colour correction when scanning reflective or transparent material by splitting the colour spectrum and luminance range and correcting each band separately. The results are quite stunning and the tests we performed show excellent colour reproduction on screen.

The PowerLook solution to colour matching is called MagicMatch. It works quite well with reflective material but less so with transparencies. The Saphir excels in both.

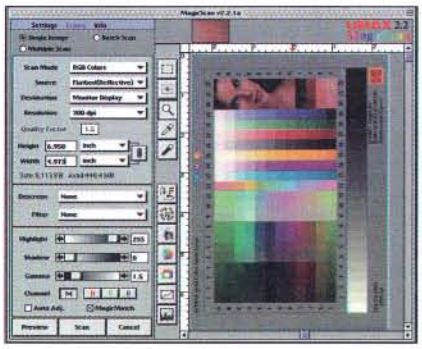
The Photoshop plug-ins include the standard options for setting the scan size and resolution and select scan quality, colour or greyscale. Both include options to descreen and adjust picture gamma, but strangely, the Saphir plug-in lacks any rotate and flip image facilities.

The PowerLook MagicScan plug-in is much more flexible and is also easier to use, allowing you to freely zoom in and out and adjust colour balance using sliders.

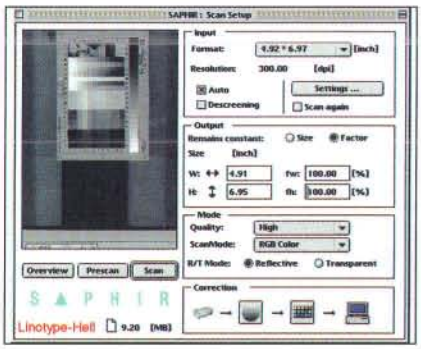
The Saphir in contrast does most things via type-in values. It also takes a three-stage approach to scanning, although you are free to skip the second. The basic overview mode displays a greyscale image of the full scan area where you can crop the image and move on to the prescan stage which produces a full-screen colour preview of the image. Some basic manual colour and contrast correction can be performed here, but normally you can leave it all to ColorSync. The actual colour correction takes place at the same time as the full scan is performed.

Extra goodies

The Umax PowerLook II has the added bonus of being shareable across a network. An extra desk accessory is included which dis-



The PowerLook II MagicScan Photoshop plug-in provides a large preview of the image along with a host of scanning options.



The Saphir plug-in is very basic, lacking essentials such as image rotation and zooming.

plays the plug-in scan window, allowing you to scan quickly and without having to run a large application first.

The Saphir cannot be shared, but does come with LinoColor Lite, a powerful application that incorporates scanning and colour correction. Among other things it can produce Kodak PhotoCD files (PCDs). In addition to ColorSync support, it also provides additional colour correction presets

customised for portraiture, landscape, still-life and more.

The final word

The PowerLook II and Saphir are both high-quality products that produce accurate scans. Scan speed is around 100 seconds for an A4 page at 300 dpi. The Saphir greyscale overview takes 15 seconds, while the colour prescan takes 22 seconds. The PowerLook single stage preview takes 44 seconds.

Since the hardware is very similar, the results are almost identical. The main differences lie in the colour correction schemes that each system employs. The Saphir's use of ColorSync is superior to the MagicMatch system used by the PowerLook.

Histogram analysis of identical subjects shows that the Saphir colour-correction system produces almost perfect results while the PowerLook has a bias towards the red, with scans a little dark. A scan of greyscale strip should produce an average density of 127 out of 255 and the Saphir was near the mark at 126 using the default settings. The PowerLook produced a darker average of 109.

The scanners perform less effectively with small format transparencies – 35mm slides can be used if you need only very small reproductions of the image. Medium-format slides can produce usable results and here the Saphir won again with its superior colour-matching system.

So while the Saphir performed best as far as colour accuracy is concerned, the PowerLook certainly has a few things going for it. First, you can buy it without a transparency adaptor and save some money in the process. In addition, it has more intuitive and flexible software – the ability to share it over a network can also be important. **– Ofir Gal**

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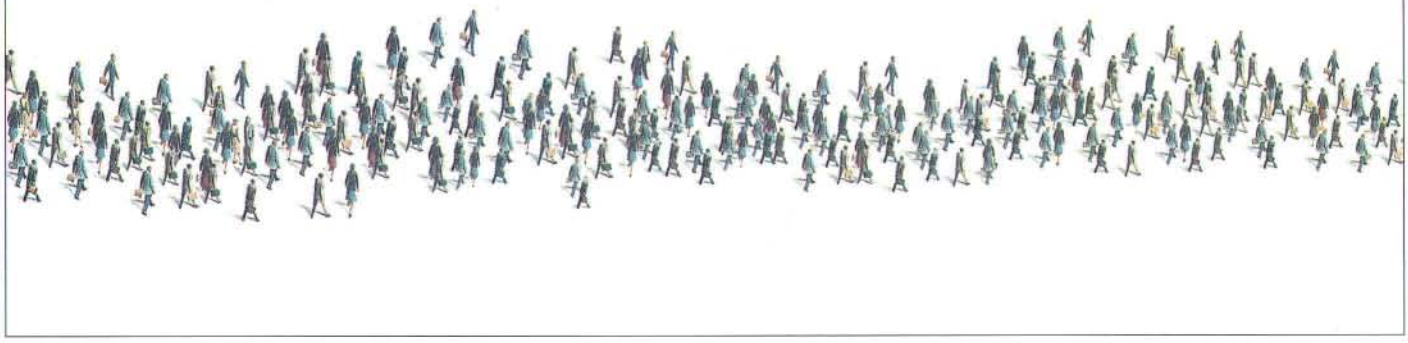
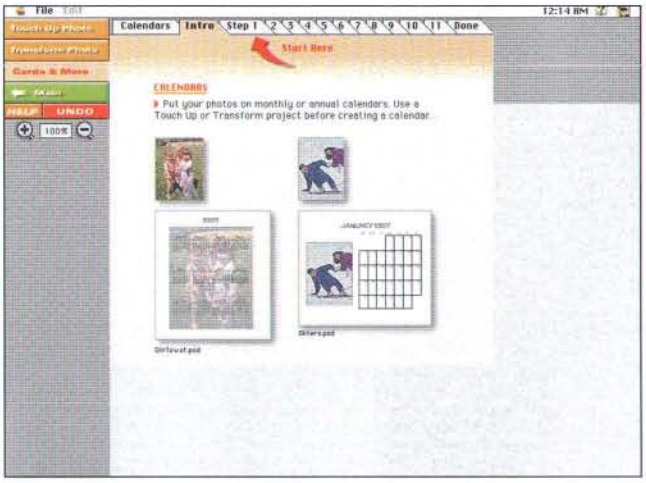
It's the product
everyone's been waiting for.



Domestic Photo Editor

PhotoDeluxe 1.0

Publisher: Adobe
Distributor: Principal, (01706 832 000)
Price: Expected to be around £99
Pros: Low price; easy to use; lots of templates; imports and exports most popular file formats.
Cons: Cryptic Photoshop-style dialogue boxes for some tools; weak help system; only one document can be active at a time; minimum system requirements too high for target market; sluggish performance.
Macworld Rating: ✪✪✪/6.3



At your service
Guided Activities walk you through the various steps to edit and manipulate your photo, and incorporate it into a creative project.

The increased popularity of low-cost colour scanners (see page 100) has created the perfect market for an easy-to-use photo-manipulation application.

Now, from Adobe, along comes PhotoDeluxe 1.0, a consumer-oriented image-editing package with a kiosk-style interface designed to hold novices' hands, carefully avoiding Photoshop's legendary learning curve. And unlike its professional-class sibling, PhotoDeluxe comes with a wide variety of templates, photo images, and clip art designed with the consumer in mind.

Like Photoshop, PhotoDeluxe offers filters that can distort, sharpen, scale, and creatively manipulate photographic images. PhotoDeluxe lets you use existing Photoshop-compatible plug-ins, too.

PhotoDeluxe can capture documents directly from desktop scanners using its TWAIN acquire module or a Photoshop-compatible plug-in supplied by the scanner manufacturer; it also imports directly from Apple's QuickTake and Kodak's DC40 digital cameras. More important for small-office users, PhotoDeluxe can import and export a wide variety of formats, including Photoshop, GIF, JPEG, TIFF, PICT, EPS, BMP, and PCX – reason enough to warrant a purchase for some users.

At first glance, PhotoDeluxe's interface looks more like a computer game than that of a digital-image–editing application. When you launch PhotoDeluxe, it hides the Finder and fills the screen with its own desktop.

If you're familiar with the basics of image editing, you can work on your own, using traditional menus or a tab metaphor. Novices can use the Guided Activities feature to step through the various image-editing functions (see "At your service"). If you're familiar with wizards in Microsoft applications you'll be right at home with this step-by-step process, although Adobe makes it a bit more visually appealing.

Multimedia-Authoring Tool

STiP Professional 2.1

Manufacturer: MacVonk **Distributor:** LanMarque (01932 222 821). **Price:** £849. **Pros:** Good (if erratic) performance; royalty-free distribution of final projects; robust scripting language. **Cons:** Awkward omissions; nonstandard scroll bars; poor documentation. **Macworld Rating:** ✪✪/4.9

Once you get past its awkward name, you'll find STiP Professional is a powerful, if quirky, multimedia authoring tool that lets you create interactive titles for the Macintosh and Windows, save finished projects in a protected form, and distribute them royalty-free. STiP stands for Screens, Trees, and scriptable Player, the program's defining characteristics. Rather than arranging media elements along a timeline, as in Macromedia Director, you draw lines that interconnect screens, creating a flowchart called a tree (see "STiPulations").

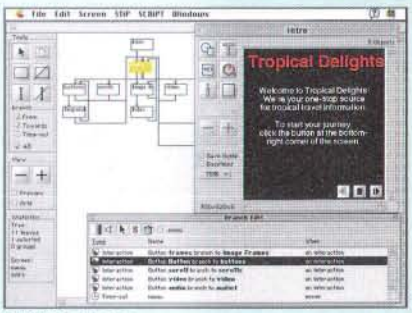
Developed by Grant Software Solutions and distributed by MacVonk, STiP has a graphical development environment similar to that of Apple's Apple Media Tool and Macromedia's Authorware Professional. Unlike Apple Media Tool, however, STiP has a robust programming language for reading and writing files, controlling a production's elements, displaying movies and playing sounds, and interacting with external devices. And unlike Authorware, STiP provides rudimentary support for text and is saddled with a vague manual and simplistic sample projects.

STiP's built-in screen editor lets you import graphics in several formats, QuickTime movies, and text. Its tools let you draw simple shapes; type text; and create interactive buttons, frames, and scroll bars.

You can also create master pages to hold elements that are used on several screens; only Authorware Professional 3.0 has a similar feature.

Although the screen editor is powerful, it has some surprising shortcomings. Unlike virtually every draw package, STiP doesn't let you press the shift key to constrain movement horizontally or vertically while dragging an element, or to retain an element's proportions when resizing. Scroll bars are another problem: the bars STiP creates don't look or work like standard Mac scroll bars, and attaching one to a lengthy text field is cumbersome.

STiP's scripting language provides a full complement of control structures, variable types, and functions. Unfortunately, the language bears little resemblance to other scripting languages, so even experienced authors will find themselves at the bottom of the learning curve.



STiPulations
You define the relationship between screens and their elements using STiP's Tree Edit and Branch Edit windows. It's a fairly simple process, although you'll scratch your head a bit at first.

The last word

STiP Professional is an odd mix of genuine power and glaring weaknesses. I wouldn't use it for text-oriented projects, but it is well suited to graphically complex ones. (You can download a demo version from **http://www.ccinet.ab.ca/macvonk/**.) STiP Professional has promise, but it needs some work to, um, live up to its name. – **Jim Heid**

Colourful icons help you select creative options. You can quickly frame your favourite photo, or easily transform it into a calendar or greeting card.

PhotoDeluxe's CD also comes with various templates for creating flyers, signs, and even faux magazine covers.

The Hold Photo feature lets you composite photos, functioning as a sophisticated scrapbook. It can give you seemingly magical powers. Imagine your friends' surprise when Sasquatch crops up in your family portraits!

A family resemblance

The PhotoDeluxe design team took an enormous risk in deviating from Apple's rigid user-interface guidelines.

For the most part, the colourful, user-friendly style works well, albeit in a cobbled-together manner. But in more than a few situations, PhotoDeluxe's lineage is all too apparent: Photoshop-esque dialogue boxes rear their ugly heads when you access many tools. In another application, this sort of code-borrowing wouldn't be as obvious, but these plain-Jane dialogue boxes are a sharp contrast to the typically colourful look of PhotoDeluxe's interface.

Even more disturbing, the tools still use Photoshop's cryptic methods, complete with terminology sure to confuse users unfamiliar with high-end techniques.

PhotoDeluxe's help system is also far from ideal. Unlike integrated systems in competing packages, the help system is a separate application called QuickHelp.

Although the content is thorough, it's definitely not consistent with the graphical nature of the rest of the interface. If Adobe is serious about creating a true consumer-level product, it needs to adopt a help system targeted to novice users, such as Apple Guide or Balloon Help. As an addition to QuickHelp, various hints – called clue cards – pop up during the editing process. Seasoned users can disable the clue cards, either individually or as a group. Still, it's a stopgap measure.

Sacrifice play

Because PhotoDeluxe is geared to the consumer market, Adobe made a number of design compromises to make it usable on the low-powered, low-memory systems typically found in homes and small offices. Most notably, PhotoDeluxe doesn't offer the ability to work with multiple photos simultaneously.

Despite the sacrifices Adobe has made in the name of simplicity, you still need a CD-ROM drive and a 68040 processor to use PhotoDeluxe.

And although the documentation recommends a memory partition of 8MB, test files caused the application to crash at this level. Increasing the memory setting to 12MB solved the problem – too bad most existing consumer Macs don't have that much memory.

Adding insult to injury, PhotoDeluxe's performance is less than ideal on typical consumer-class systems. Some tools and filters are excruciatingly slow.

The Last Word

PhotoDeluxe isn't picture-perfect, but is a suitable compromise between brute strength and grace. Its tools are easy to use, and its templates are a welcome addition for those who need a little creative boost.

PhotoDeluxe's low price and fun features make it a logical choice for the home user – but penny-pinchers beware: its flaws significantly limit its viability for business use.

If you're using Adobe Photoshop simply as an import/export tool – and don't need colour-separation capabilities or other high-end features – then you'll benefit from PhotoDeluxe's lower price.

– Blake Roberts

continues page 86

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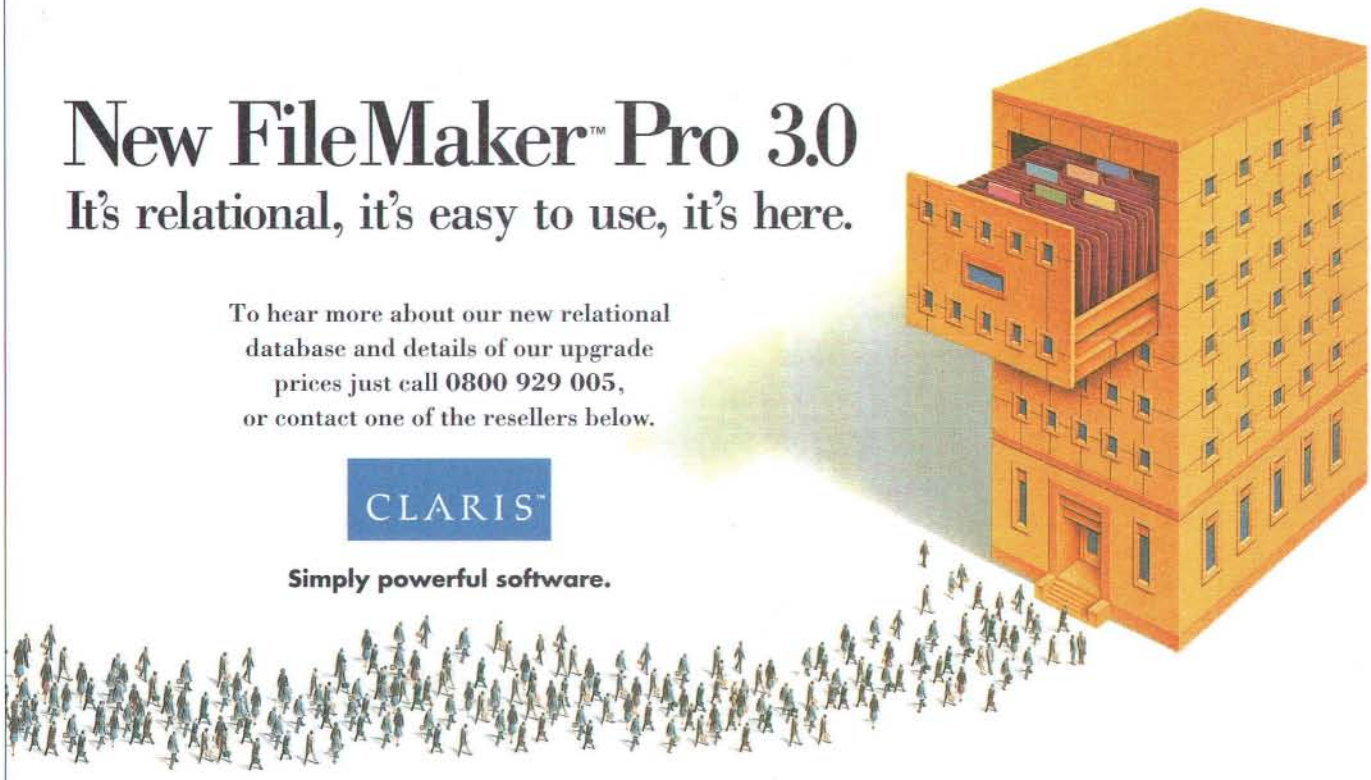

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Mac OS

Designed for Microsoft Windows 95

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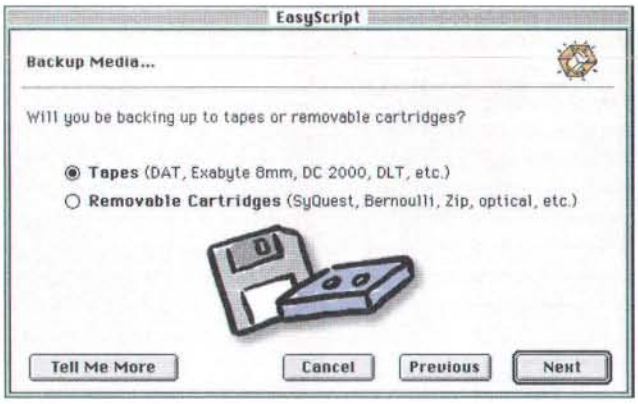
Backup Software

Retrospect 3.0, Retrospect Remote 3.0

Publisher: Dantz Development
Distributor: Frontline, (01256 841 841)
Price: Retrospect £162; Retrospect Remote (ten users) £339.
Pros: Improved interface; better scripting; innovative Backup Server.
Cons: No Windows client.
Macworld Rating: ✪✪✪✪/8.9



When we say easy...
With EasyScript, all you need to do is answer a few simple questions; Retrospect produces a complete backup script for you.

Dantz's Retrospect and its network-aware alter ego, Retrospect Remote, have long been the preferred backup programs in the Mac market. The latest version confirms Retrospect's dominance and leaves the competition in the dust.

The earlier versions of Retrospect were powerful but difficult to use. Dantz has resolved that shortcoming in version 3.0, which has a new tabbed-folder user interface that I find much easier to navigate; it lets you begin backing up with as few as three mouse-clicks.

Dantz has also done away with the jargon that plagued previous versions of the interface and has rewritten the user manual to include more (and better) examples and tips. As before, Retrospect can use virtually any backup media, from tape drives to disks; now it can also use some recordable CD units for permanent archiving.

Retrospect 3.0 is single-user, while Retrospect Remote 3.0 adds the ability to back up client Macs to a central Mac over a network. (The base Retrospect Remote can handle 10 clients, with additional Remote Packs available in increments of 5, 10, or 50 users.)

Both are Power Mac native, optimized for 604-based Power Macs. Macworld Lab tests show a performance increase of 10 to 15 per cent over version 2.1. (Of course, the power of the hardware Retrospect is running on determines backup speed.) On my Power Computing Power 100, local performance was excellent; likewise, using Retrospect Remote, I backed up several client machines over a network with ease.

Although Retrospect is superb at backing up Mac-only installations, it still lacks a Windows client. Dantz expects to release one later this year.

Containers and Scripts

For local desktop and networked backup clients, Retrospect 3.0 uses containers, which hold the disk volumes to be backed up. For example, say you have two hard disks and a SyQuest drive attached to your Mac. With previous versions of Retrospect (and with all other Mac backup programs), a script would back up the contents of the SyQuest drive only if the inserted cartridge was present when the script was created.

When you tell Retrospect 3.0 to back up the entire local desktop container, it automatically backs up the hard disks and whatever cartridge is present. The program is smart enough not to back up floppy disks, mounted network volumes, or CD-ROMs (though you can back those up if you like). You can create folders within a container to organize its contents, a boon for network managers who need to keep track of dozens or hundreds of remote clients.

Managers can now organize remote clients into logical folders by department or any other grouping, rather than deal with a single, unwieldy scrolling list.

Creating backup scripts was difficult in earlier versions; many users simply threw up their hands at the dizzying number of options available. In 3.0, the new EasyScript asks you a few simple questions, then creates a custom script that includes scheduling and media rotation and suggests an offsite backup strategy.

Retrospect's Apple Events support is excellent. Scriptwriters can now control virtually every aspect of Retrospect's operations, and Retrospect can trigger scripts. Dantz supplies several sample scripts, including one that works with Ex Machina's Notify to send a message to your pager alerting you that the tape drive contains the wrong tape.

The new Backup Server is reason enough to upgrade to 3.0, especially if you back up many Macs over a network. This special Retrospect script intelligently manages your backup resources and the computers to be backed up.

After checking to see which backup media are available, Backup Server prioritizes the source volumes to be backed up, with the least recently backed-up disk at the top of the queue. It then polls the local machine and the network to see which source disks are available. Retrospect begins backups at the top of the queue, working its way down the list for however long you set Backup Server to operate.

Remote users can request to be backed up as soon as possible, and PowerBook users can be backed up automatically on connecting to the network.

Previously, sites with many networked clients couldn't always back up all their Macs in the time allotted (overnight, for example); administrators had to split remote clients into groups for backup on successive nights. The new Backup Server simply backs up as many remote clients as it can in the allotted time, then backs up the remaining clients on successive runs until it has backed up all the clients.

Backup Server is especially useful in conjunction with a multiple-tape DAT loader. This combination gives harried backup administrators maximum flexibility; they can insert tapes from several storage sets into the loader and let Backup Server switch automatically between sets as needed, even using blank tapes when necessary for media rotation.

The last word

Backup isn't an exciting subject for most people, and progress in this field tends to be slow and incremental.

I commend Dantz for its innovation in creating Backup Server, which adds functions no other backup software matches. There's no better program than Retrospect to safeguard your data. – **Tom Negrino**

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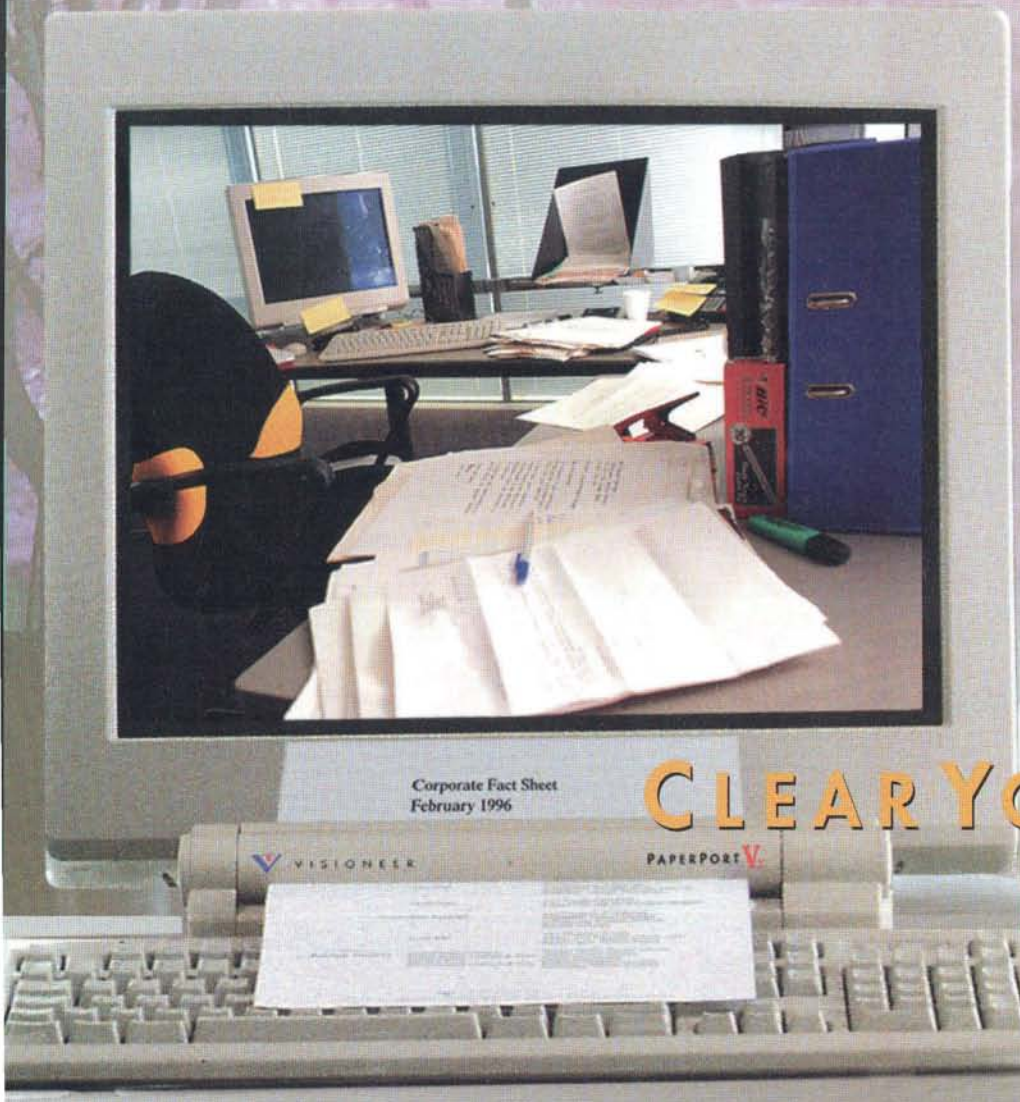

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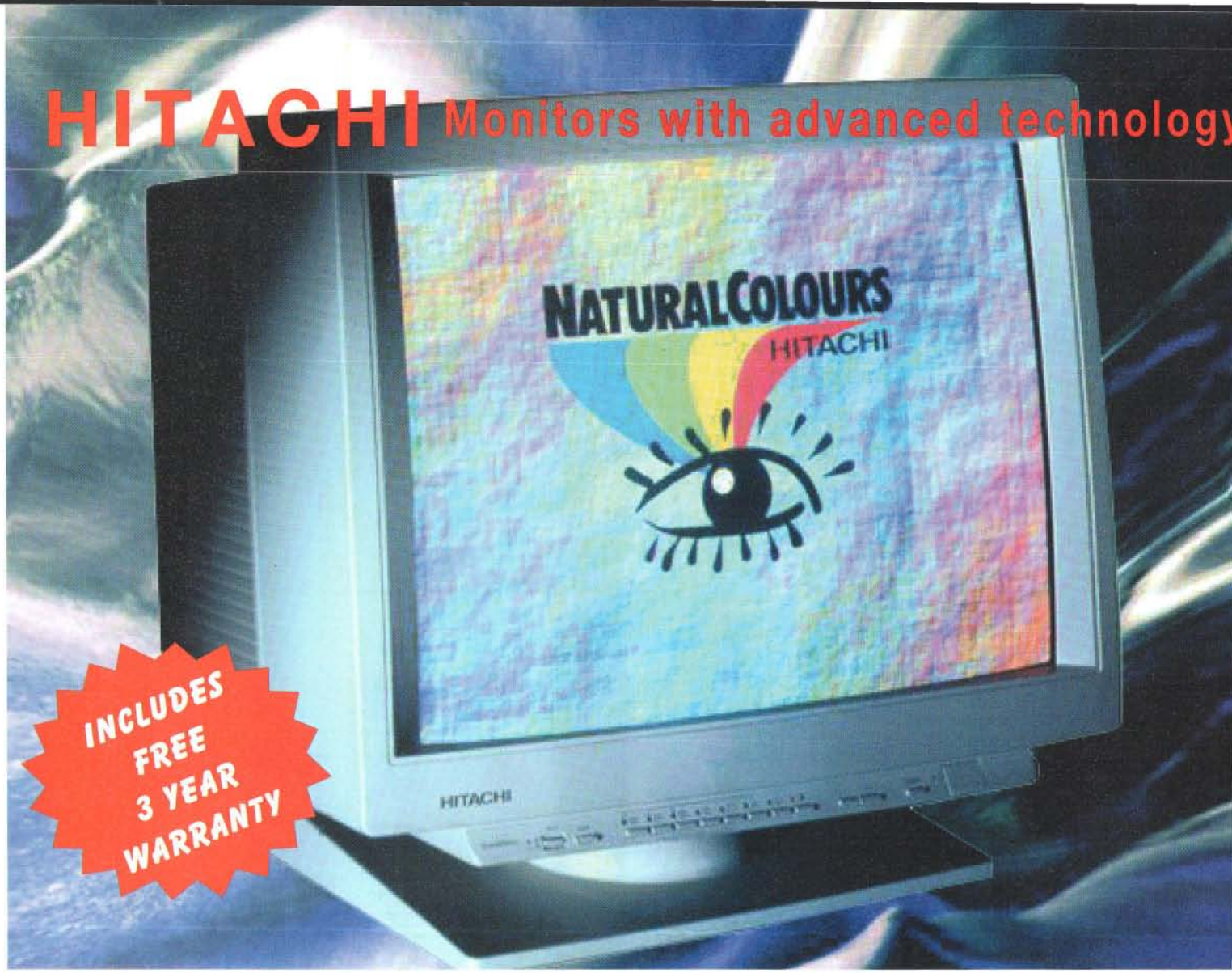

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Font Manager

FontConsultant

Publisher: FontWorks (0171 490 5390)
Price: £59 until end of April, £69 afterwards
Pros: Good solution to age-old issues of font management
Cons: Uses 1MB of memory, patches OS: may cause conflicts
Macworld Rating: ✪✪✪✪/7.2

reviews

What's the font?
FontConsultant from FontWorks makes font selection a more exact craft.

Forget multitasking, what the Mac OS really needs is better font control. Each major upgrade improves matters but you still struggle if you're managing more than 256 fonts.

FontConsultant aims to solve this by letting you swap groups of fonts in and out as needed and to add functions that help you pick the right fonts in the first place

It's like a Suitcase for the 1990s but with more options. You have to install the FontConsultant system extension, which since it's patching such a fundamental part of the operating system might be a problem. However, from then on the package is an application in your Apple Menu.

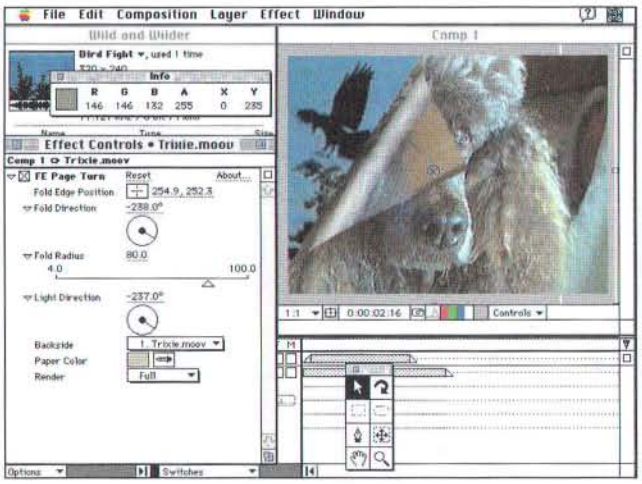
The first time you open this you get a blank fonts list which you have to fill by specifying which folders FontConsultant

continues page 90

After Effects Plug-ins

KPT Final Effects 3.0

Publisher: MetaTools
Distributor: Principal (01706 832 000)
Price: £450
Pros: Excellent rendering quality; tightly integrated into After Effects 3.0; useful selection of effects.
Cons: Expensive.
Macworld Rating: ✪✪✪✪/8.9



MetaTools' KPT Final effects 3.0 is a library of plug-in modules that adds 28 film-quality effects to Adobe After Effects, one of the digital-video world's favourite effects programs. Final Effects taps directly into After Effects' video-altering engine and adds new effects and transitions to the Filter menu.

The Final Effects library breaks down into eight categories: distortion, channel, image control, light, particle, perspective, stylize, and transition. The seven distortion filters let you, among other things, slant movies or images, create slanted drop shadows, cut an image into animated squares, and create a vortex effect.

Several image-control and channel filters make it easier to create image masks; they also let you composite two images in a single layer, something After Effects can't do on its own.

Final Effects also adds several new transitions, including a gorgeous 3D page peel, two types of wipes, and Twister, in which an image twists as if it's being wrung out. New filters include Sphere, which projects an image onto a sphere whose surface properties and illumination you control; Scatterize, which creates an exploding image; and Kaleida, which reflects an image for a kaleidoscope effect.

In the particle system, nine filters create everything from fully controllable starbursts and bubbles to rain and flames.

Unlike some third-party effects plug-ins, the Final Effects filters are tightly integrated into After Effects. You can animate the effects over time by creating keyframes in After Effects' Timeline window.

With the Rain particle generator, for example, you can create a gentle drizzle that gradually turns into a windblown downpour. You adjust filter settings in After Effects' Timeline window or its new Effect Controls window.

The plug-ins' rendering quality won't disappoint After Effects veterans. Clips rendered with Final Effects' 3-D filters have a particularly rich appearance. And while some plug-in collections include bizarre, gimmicky transitions you'd rarely use, the Final Effects library contains nothing but genuinely useful effects.

The last word

At £450, Final Effects is on the pricey side—the base version of After Effects 3.0 itself sells for only a bit more. But the price is justified, given the fact that Final Effects delivers results normally associated with seven-figure video workstations. If you work extensively in After Effects, your system isn't complete without Final Effects. **– Jim Heid**

should look. Typically that will be the System Folder's Fonts folder, perhaps Fonts (Disabled) if you've been using a startup manager, and maybe some font-shipping applications.

Once you've specified these folders, FontConsultant builds a list of all fonts on your system in those places, including duplicates that are marked as such.

Taking one font at a time, you can see a sample of what it looks like in plain, bold and italic. You can also see excellent font information. As well as showing that a font is a TrueType one, for instance, it tells you the font ID number, the x-height, the M-height and an average number of characters per line at a given point size.

Whether you choose to use this information or not, you can then select multiple fonts and group them into what the software calls *catalogues*. So if you create one catalogue for "Marketing Presentations" and one for "Newsletter", you have a straightforward of swapping in the fonts you need for any given job – like the way Thunderbird 2 used to settle on a particular green pod before

blasting off on its mission.

There are limitations on what you can do with fonts. But these limitations are predominantly caused by the operating system. You can't, for instance, have any control over fonts you leave in the System Folder's Font folder.

You can catalogue them and you can get the font information for any or all fonts there, but your Mac will load those fonts regardless of what FontConsultant says. The small but very thorough documentation suggests solutions.

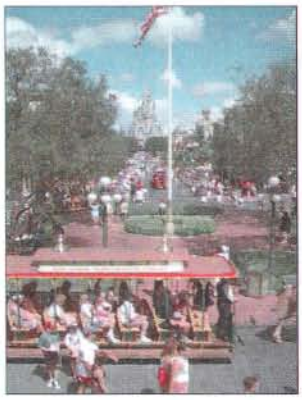
While FontConsultant does a good job well, it's quite big: the application takes 500K of disk space (compared to the 10K extension) and it requires 1MB of memory. If you routinely deal with many fonts, though, this package will save a lot of irritation by making it easy to swap groups of fonts in and out of use, and by showing you enough information to make font selection a more exact craft. – **William Gallagher**

Digital Camera

HARDWARE

Chinon ES-3000

Manufacturer: Chinon America
Publisher: Bannerbridge (012168 419 101)
Price: £749
Pros: Close-up focus and framing guides; 3x zoom function; accepts memory cards.
Cons: High price; colour and detail don't measure up to the Kodak DC40's; needs better software.
Macworld Rating: ●●●/6.4



Two cameras, one view
I shot these two photos within seconds of each other from the same position and looking in the same direction. The ES-3000 (left) let me get closer to the action with its built-in zoom, but the Digital Camera 40 (right) provided better colour and more subtle contrast, especially in the sky and trees.

Like the Apple Quicktake 150 and Kodak Digital Camera 40 (see Reviews, January 1996), the Chinon ES-3000 is the optical equivalent of a £50 film camera; it costs about 20 times more only because it takes computer pictures. No developing, no scanning – just shoot the pics, copy them to your hard drive, decode them, and they're ready to go. You're paying for convenience, not quality or control.

Generally speaking, the ES-3000 offers more optical flexibility than either the QuickTake or the Digital Camera 40 (DC40), which are fixed-focus cameras that can shoot objects four feet or more away and require special lenses for close-up shots.

The ES-3000 offers an autofocus function with a range as close as 19 inches. Given the limited resolution of the ES-3000's images, the primary benefit of its autofocus system is that you can capture close-up shots (19 inches to four feet) without extra lenses. The ES-3000 also includes viewfinder guides to help you frame close-up shots; with the Apple and Kodak cameras, it's all guesswork.

The ES-3000's variable zoom lets you shoot at up to 3x magnification – continuously, not in fixed increments. The camcorder-style buttons, positioned next to the shutter-release for easy access, have distinctive shapes so you can keep your eye glued to the viewfinder. Although the ES-3000 is not a single-lens reflex camera, the zoom affects both the viewfinder and the lens.

Heavy zoom use can affect battery life dramatically, but it's an excellent capability that I wish other consumer-quality digital cameras offered.

The ES-3000 doesn't fare well in the areas of resolution, image capacity, and colour quality, especially when compared with the DC40. Like the QuickTake, the ES-3000 takes 640-by-480-pixel images; the DC40 goes 25 per cent better.

The ES-3000 holds up to 10 full-resolution images, while the QuickTake holds 16 and the DC40 holds 48.

But like Kodak's more recent DC50, the ES-3000 accommodates a PC Card memory-expansion module that stores additional pictures. With a 4MB card (costing £299), for example, the ES-3000 holds up to 43 images. (normal setting; 212 images, fine setting; 53 images, superfine setting; 26 images).

You can also regulate the amount of compression applied to an image – a feature unique to the ES-3000. Without a PC Card, the camera holds 40 images with standard compression or 5 images with minimal compression. But even with light compression, ES-3000 images don't hold a candle to those from the DC40 (see "Two cameras, one view").

As with the DC40, you have to load and decode images from the ES-3000 before you can manipulate them with image-editing software; QuickTake images are ready to go after you copy them to your hard drive.

The last word

The ES-3000's software is extremely irritating, but its focus and zoom functions more than compensate. If it managed images better and improved the colour quality, I'd recommend it.

As it stands, the Digital Camera 40 is the best choice in this class, followed by the ES-3000, and then the QuickTake. Now if only someone would merge the features of all three cameras and cut the price in half, most of us could say goodbye to film for good.
– Deke McClelland

continues page 92

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Hand-held OCR Scanner

Mac IRISPen

Manufacturer: Image Recognition Integrated Systems
Distributor: Image Data Systems (0171 336 7942)
Price: £249
Pros: Portable; accurate; lets you scan just what you need; accommodates uneven scanning strokes and variable text.
Cons: Tedious for large quantities of text; networked users must turn off AppleTalk to free up printer port.
Macworld Rating: ●●●●/7.7

SUZANNE ROADY

Can you handle it?
Most probably, yes. Mac IRISPen is simple to use and very forgiving of shaking hands.

The Mac IRISPen is a researcher's dream come true, particularly for PowerBook users who want to extract a few paragraphs from a report or when using a full-size flatbed scanner would be impractical or overkill.

This small, handheld scanner grabs text at 100 characters per second, converts it using OCR software, and inserts it directly into your application. The pen recognizes most printed material with a high degree of accuracy, and you can improve its precision by creating dictionaries of the fonts you encounter most often and training it to read oddball characters and fonts.

The mini-scanner consists of the data pen itself, roughly the size of a VCR remote control, linked to an interface device that doubles as a cradle. A cable from the interface, which is powered by batteries or an AC adaptor, plugs into your serial modem or printer port (use the modem port if your desktop machine is on a network, since you must disable AppleTalk when using the pen with the printer port). Both the modem or printer and the IRISPen can be plugged in simultaneously using a pass-through connector on the interface. A parallel-port version of the IRISPen that uses a proprietary NuBus card is also available.

To use the IRISPen, you click on the IRIS application icon, lift the pen from its cradle, and pass the pen over a line of text as if you were using a highlighter. You can view the line you're scanning through a window in the pen; guidelines help you pinpoint the line you wish to capture.

A roller at the tip of the pen acts as a start/stop switch, and a sliding control on the pen adjusts brightness. You can even insert a carriage return, space, tab, or other user-defined character by clicking a button on the side of the pen. Text of varying size, style, and quality presents no problem. (Because the scanning path is less than a half-inch high,

continues page 94

Font Utility

theFONDler 4.0.1

Publisher: Rascal Software **Distributor:** MacWarehouse (0800 181 332). **Price:** £49.95. **Pros:** Extensive tests for font problems; aids for organizing fonts. **Cons:** Problem explanations and solutions not always clear; user interface needs work. **Macworld Rating:** ●●●/6.5

Does your font sever behave strangely? Perhaps a font you installed doesn't show up in a Font menu. Or it shows up in the menu but prints as another font. Maybe a font seems to print just fine – until you notice it has no kerning pairs. If you use a lot of fonts, sooner or later you'll encounter behavioural mysteries.

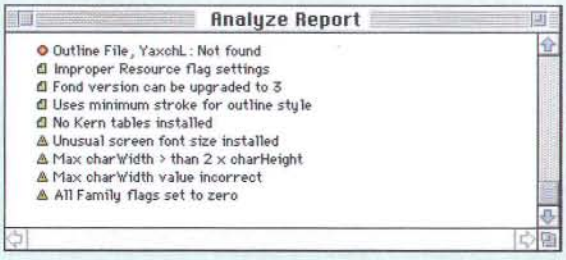
In many cases, theFONDler can solve them. This diagnostic utility can spot – and often fix – a variety of font problems. (Its name derives from the FOND – font family descriptor – resource.) Font troubles stem from a number of sources, including font-ID-number or -name conflicts, missing fonts, damaged files, or files that weren't created according to specs. theFONDler spots these anomalies, and others.

The Analyze function checks your font library for possible problems and generates a list of any glitches it finds. Icons indicate the severity of each problem, from items of interest (for example, the font requires the Symbol font to print certain characters) to highly suspicious findings (a corrupt PostScript printer file).

These findings don't always tell you why a font is misbehaving, but in some cases they point you to a solution; if a file is damaged, for example, you can try reinstalling the font from its original disk.

theFONDler can also help you organize your fonts. The Collect function gathers all the fonts on your hard disk into a single folder; the Disburse function arranges them into family-based folders. Once theFONDler rounds up your fonts, you can have it check for duplicate font-ID numbers or names, which can cause frustrating display and printing problems. Another handy option automatically deletes unwanted screen-font sizes, which many ATM users like to do.

You have to know a thing or two about the internal workings of fonts to understand many of theFONDler's messages. A casual user probably won't know what to do when informed that "Family ID differs from Resource ID." Unfortunately, the manual, although detailed, does little to enlighten you as to what some of the problems might mean, or what you can do to fix them. The user interface can be intimidating as well; I found navigating from menu item to dialogue box to sub-dialogue box to be confusing in some cases.



Inner workings of fonts theFONDler's Analyze function checks fonts and lists problems.

The last word

theFONDler is a versatile and valuable diagnostic tool, but it's not for everyone. If you understand the basics of how fonts work, but are still be-deviled by puzzling font problems, theFONDler may be just what you need. It can also come in handy for owners of huge font collections, font designers, people who want to check the quality of bargain fonts, or those who send files to imaging service bureaus. – **Erfert Fenton**

Our many publications may bring up some issues for the type user.

Like, "Why do we need more typefaces?". Why do we need more books, more poems, more paintings, more wines?

A typeface is simply the result of human creativity.

Typefaces hold a fairly unique position in that, whilst the result of a highly focused and complex artistic endeavour, they are put to use in a semi-industrial environment, with all the implicit contradictions.

Every time there is a major advance in the graphic arts or pre-press technologies – and pre-press has been at the front of technical change throughout this century – there is a major increase in creative endeavour.

More typefaces are one obvious result of this.

Furthermore it can be demonstrated that typography always reflects contemporary culture.

Gutenberg's use of type reflected the work of the scribes.

Bodoni's layouts and types fitted the grace, style and architecture of 18th Century Italy.

Types of the 1980s mirrored that decade's vulgarity and hype.

Current trends ape the decay of our inner cities with the fashion for distressed type and the instant gratification of our consumer societies with typefaces coming to the market in months rather than years.

In other words, we're all in this together: whether we like it or not, there will be more and more typefaces available to more and more people.

At **FontWorks** we happen to like it: typography is the most public, yet unrecognized of the arts, and that has always been a tragedy.

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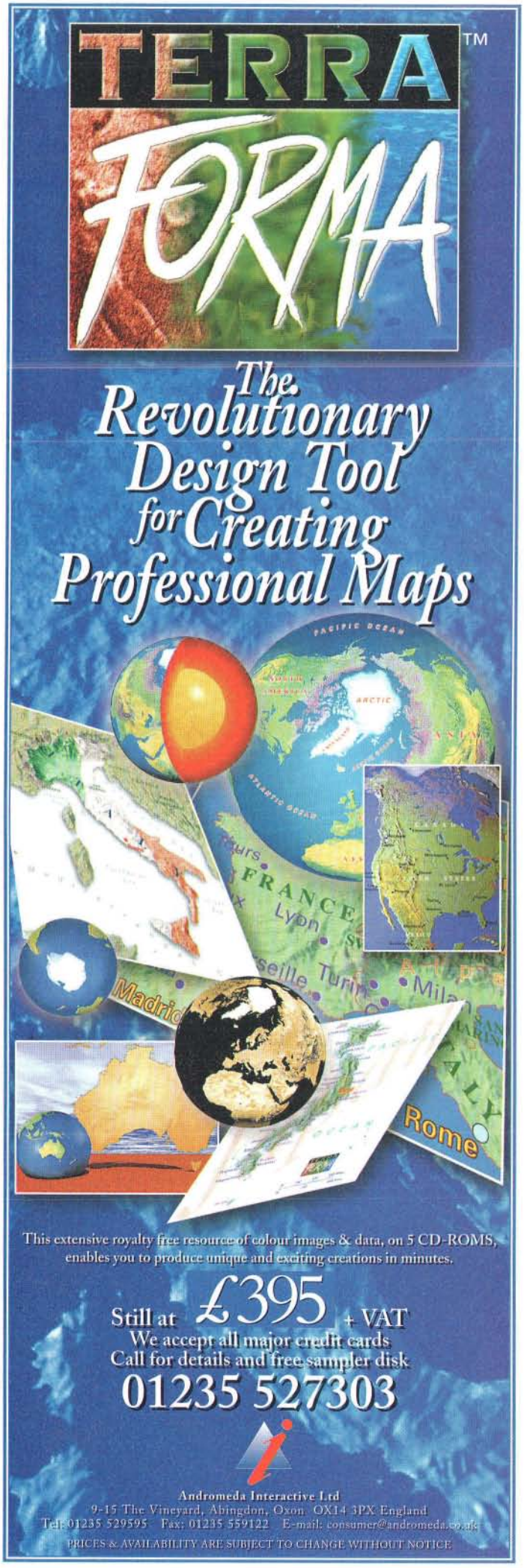
FONT WORKS



though, text must be 22-point or smaller to be recognized.)

The IRISPen is remarkably forgiving of errant pen strokes; it accurately translated text even when my hand movements varied in speed or were slightly skewed. The pen also accommodates both left- and right-handed users.

The last word

The IRISPen isn't designed for high-volume OCR applications and can't capture images, but it shines at specialized data input, such as grabbing customer numbers from invoices or transferring figures from spreadsheets.

It's small enough to be easily portable, and its OCR accuracy is sufficient for most applications (although you'll want to double-check figures scanned in from spreadsheets). It's more expensive than the similar Primax Datapen, but has superior software. This is definitely a niche product, but one that meets an important need.
– David Busch

QuickDraw 3D Accelerators

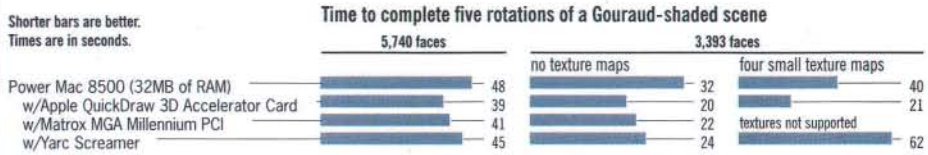
QuickDraw 3D Accelerator Card

Manufacturer: Apple Computer (0800 127 753)
Price: £299
Pros: Supports texture maps; outputs alpha channel.
Cons: Minor speed gains with major 3D applications.
Macworld Rating: ○○○/5.0

Yarc Screamer

Manufacturer: Yarc Systems (001 805 499 9444)
Price: $995
Pros: Supports texture maps.
Cons: Slower than no board in some instances; chokes on simple models.
Macworld Rating: ○/1.9

Fast on the Draw?



Tests conducted with 3D World 1.0. – **Macworld Lab testing supervised by Danny Lee**

Boy, are we disappointed. With QuickDraw 3D accelerator manufacturers promising "rendering speeds as high as 12 times faster" than unaccelerated rendering, we had visions of working exclusively with smooth Gouraud-shaded and texture-mapped 3D models. But despite the hype, we found much more modest performance gains.

To display a 3D object, your CPU calculates the object's geometry, converts it to triangles, and then rasterizes each triangle. A 3D accelerator takes over the rasterization process, freeing your CPU from this time-consuming task. The potential for improvements in performance can be seen using demonstration applications, such as Apple's Gerbils roller-coaster game.

Macworld Lab testing revealed that price and performance are inversely related. The most expensive board, the Yarc Screamer, generated barely noticeable speed gains and actually increased rendering times in our texture-map test.

Furthermore, our Mac repeatedly froze during Yarc testing. According to the company, updated drivers and future products will remedy the problem, but for now we can't recommend this board. Indeed, *Macworld* understands a full UK launch has now been delayed.

The Matrox MGA Millennium PCI – a QuickDraw 3D accelerator and graphics board – provided a moderate 10 to 20 per cent speed improvement in our Gouraud-rendering test for QuickDraw acceleration.

But the artifact-filled rendering and the board's inability to display a texture map negate its speed advantage. Since all Power Macs support texture mapping, why pay hundreds of pounds for a board that doesn't? Interestingly, combining the Matrox board with Apple's 3D accelerator board improves rendering quality and restores texture mapping. (For more on the Matrox, watch for *Macworld*'s review of PCI graphics cards in an upcoming issue.)

Apple's QuickDraw 3D Accelerator Card offers the lowest price with the best performance. It offered the smoothest images in the least amount of time. It's the only board we tested that supports transparency, constructive solid geometry (CSG), and alpha channels.

Note that, unlike the Matrox and Yarc boards, Apple's board doesn't connect to your monitor. You must still use built-in video or an additional PCI monitor board. But a single Apple 3D board can accelerate 3D rendering to multiple monitors.

Microspot's 3D World 1.0, our benchmark application, was built from the ground up around QuickDraw 3D. Heavy-duty 3D applications Specular Infini-D 3.1 and Strata Studio Pro 1.75+ have features and data structures that these QuickDraw 3D boards don't accelerate.

The same *Macworld* model that rotates smoothly in 3D World exhibits jerky motion in Studio Pro and Infini-D. Studio Pro 1.75+ creates 3DMF files (QuickDraw's native file format) that are more complex than they need to be. (The shareware 3DMF Optimizer optimizes complex 3DMF files for maximum speed and minimum size.)

More-complex 3D models need the features of an application like Infini-D or Studio Pro. Unfortunately, the more advanced your modelling needs, the less speed improvement 3D accelerator boards provide. In real-world use, expect to continue working with bounding-box, wire-frame, and flat-shaded renderings.

Even Apple's board performs slowly when previewing scenes with more than a few simple models. A 604 PowerPC Mac with QuickDraw 3D software is a better long-term investment. The scheduled spring release of QuickDraw 1.1 should improve 3D hardware and software performance.

Finally, current 3D boards don't increase ray-tracing speed or other mathematically demanding tasks. They don't claim to, but you should realize that generating final-quality Phong or ray-traced images for video, film, or print is still a time-consuming process.

The last word

If you have money to burn, consider selling your current machine and buying a 604-based PCI Mac. The 604 provides fast Gouraud shading and texture mapping, even without an accelerator.

After you have a PCI Mac, buy 8MB of RAM to cover added system overhead. If you have money left over and you use Infini-D 3.1 or Studio Pro 1.75+ for hours at a time, consider Apple's board. QuickDraw 3D acceleration promises to improve the way you work with three dimensions. Save your money until it does. **– Jim Feeley and Danny Lee**

No-frills Multimedia Tool

ProView 1.1

Manufacturer: E-magine
Distributor: AM Micro (01392 426473)
Price: £79
Pros: Simple to use; includes viewer applications.
Cons: Can't import text; no drawing tools; supports few file formats and colours; occasionally unstable.
Macworld Rating: ✪✪/4.0

Easy pieces
Creating new pages with ProView takes almost no time to learn

Take the concept of multimedia authoring, strip it to its essence, and you're left with ProView. This no-frills tool let you combine graphics, sound, and QuickTime movies into basic interactive presentations, but it lacks many of the features needed to produce polished, professional results.

ProView lets you create and freely distribute simple, slide-show-style presentations that are either self-running or interactive. It takes almost no time to learn; creating new pages, adding media elements, and creating button links to other pages are simple and intuitive.

Unfortunately, a sparse feature set seriously limits ProView's usefulness. The program supports only PICT and JPEG graphics; you're limited to a palette of 11 colours; you can't import text from other programs; and ProView lacks drawing tools entirely.

While the button links make it easy to navigate a presentation, no transitional effects are available; ProView simply cuts abruptly from page to page.

(E-magine promises to fix these problems in the next release.)

Finally, ProView is prone to lockups and crashes when individual pages contain multiple PICT images. ProView documents with embedded QuickTime movies also cause the application to crash.

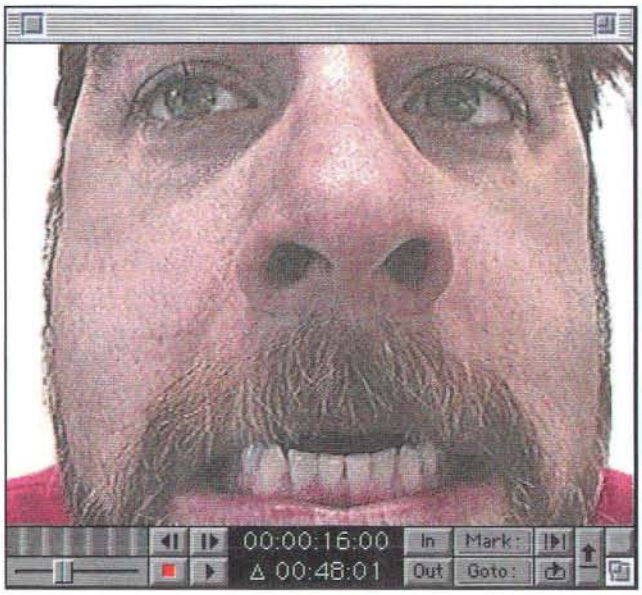
The last word

E-magine's ProView is a cheap and simple - if limited – way to create a self-contained, self-running application.
– Joseph Schorr

Digital Camera

Sony PC Cam

Manufacturer: Sony
Distributor: Vision Warehouse (01734 756 888)
Price: £350
Pros: Freestanding with gooseneck mount; small footprint; lens rotates 90 degrees.
Cons: Mono sound; lacks S-Video cable; lighting response inferior to FlexCam's.
Macworld Rating: ✪✪✪/5.9



The perfect frame
The PC Cam lets you frame and focus your subject with alarming accuracy. But background highlights tend to wash out and the lens produces a pronounced fish-eye effect.

Sony's PC CAM desktop video camera lets you record impromptu QuickTime movies, scan still video images, or project your smiling visage over a videoconferencing system using your AV-equipped Mac.

Like its rival, VideoLabs' FlexCam (see Reviews, December 1994), the PC Cam features a manual-focus lens with a 0.25-inch colour CCD (charge-coupled device) mounted on a flexible gooseneck.

You'll appreciate the PC Cam's small size. Its base is just 3.5 inches wide – half the width of the FlexCam – and its neck is 11 inches long, compared with the FlexCam's 18 inches.

Like the FlexCam's, the PC Cam's neck retains shapes no matter how much you twist and turn it; you can shoot objects sitting on a tabletop or frame a person's face without repositioning the camera's base. Even better, you can centre the camera in front of your monitor so that you look directly into the lens while viewing on-screen images, a must for videoconferencing. You can also rotate the camera head 90 degrees without adjusting the neck.

Unfortunately, the PC Cam's sound and video are second-rate next to the FlexCam's. For example, the PC Cam sports a monaural microphone. And although the PC Cam offers two video jacks—composite and S-Video—Sony neglects to include an S-Video cable.

The PC Cam can focus on objects as close as 0.44 inch (FlexCam goes closer at 0.25). Even though the PC Cam lets you adjust the iris to compensate for poor lighting, it requires at least 9 lux to function, compared with the FlexCam's less than 3. So, you have to turn on extra lights, which can result in too-bright highlights and exaggerated contrast.

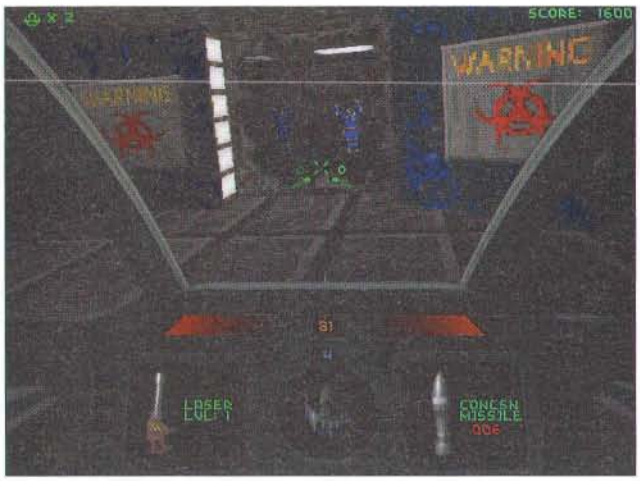
The last word The PC Cam's inconspicuous appearance and size is its only real advantage. Though the PC Cam performs its job reliably, it's inferior to the FlexCam in most regards. Equipped with higher-quality sound, better video, and all the necessary cables, the FlexCam is simply the better camera.
– Deke McClelland

Shoot-'em up Adventure

ENTERTAINMENT

Descent 1.0

Publisher: MacPlay
Distributor: Interplay (01235 821 666)
Price: £39.99
Pros: Real-time 360-degree motion; realistic graphics and audio.
Cons: Fewer levels than PC version; CD must be in drive to launch; no support for 680X0 Macs.
Macworld Rating: ✪✪✪✪/8.5



Daring rescue
You've found the hostages. Now you have to get them out alive.

Does a shoot-'em-up adventure have to include lots of blood and mayhem to be fun? Looking at the current crop of games, you might think so. Luckily for the squeamish, Descent changes all that. There's no carnage in this game; your opponents are asteroid-based mining drones. Your mission is to rescue hostages, destroy a power reactor, and get out of the mine before it explodes.

Descent's most stunning innovation is its 360-degree, 3D manoeuvrability. Mine shafts head off in all directions, and you quickly lose the concept of "up." You hurtle through shafts, shoot robot drones, and replenish your supplies.

As you manoeuvre your fighter craft through the mine, it bobs slightly as if on a cushion of air. You actually feel as if you are floating gravity-free. Sounds come from all directions, making for a realistic experience. As your skills improve, the mining robots learn to outwit you, adjusting strategies based on your movements.

In addition to single-player options, Descent offers an anarchy mode in which every person fends for him- or herself, or a collaborative mode in which players team up against the robots. To test Descent's multiplayer features, I enlisted volunteers to play a network game on four Power Macs connected over ethernet. We all agreed: Descent sets a new standard for player immersion.

If you work in a cross-platform environment, you'll be able to collaborate with up to eight of your co-workers, regardless of their platform preference; Mac and PC versions of Descent can participate in the same network game. And, unlike competing games, Descent lets single players leave or enter at any time – if one person gets called away to a meeting, you don't all have to quit playing.

Despite its innovations, Descent has its share of minor drawbacks. Although the game installs on your hard disk for optimum play, you're required to leave the CD-ROM in the drive to hear sounds while playing. To provide the fastest action, Descent operates exclusively on Power Macs, leaving 680X0 machines behind. The Macintosh version ships with just 30 predefined levels – compared to the more generous 120 on the PC game.

The last word Descent already offers true innovation in the crowded field of adventure games, and its graphics will impress hard-core gamers.

When version 1.1 ships in a few months, its support for QuickDraw 3D will make its realistic environment even more impressive. I can hardly wait. **– Fred DeLisio**

Interactive Thriller CD

ENTERTAINMENT

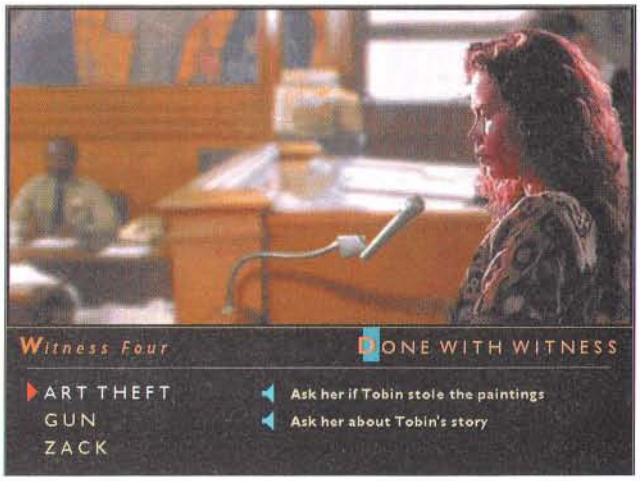
In the 1st Degree

Publisher: Brøderbund (01429 273 029)
Price: £41.50
Pros: Seamlessly integrated digital video; excellent acting and cinematography; multiple plot threads and endings; 'expert' analysis from TV news team after game.
Cons: Less interesting after a few playings; incompatible with QuickTime Power Plug extension.
Macworld Rating: ✪✪✪✪/8.6

Even if you didn't get hooked on the O J Simpson trial, there's a good chance you'll get sucked into Brøderbund's high-tech courtroom drama, In the 1st Degree. This interactive adventure mixes intrigue, suspense, psychology, and a dash of cynical humour in a slick package that's nearly irresistible.

You see the world through the eyes of an attorney working a complex, high-profile murder case. Your job isn't to determine whodunit – art-gallery owner James Tobin freely admits he shot his partner. As prosecutor, you need to systematically disprove Tobin's claim of self-defence so you can win a first-degree murder conviction.

More than any game we've played, In the 1st Degree has the look, feel, cinematography, and pacing of a high-quality television drama. Emmy-award – winning producers, working with professional actors, state-of-the-art digital-video techniques, and a first-rate script, bring new realism to the genre of interactive fiction.



The last word In the 1st Degree is a technological tour de force. If interactive television is the future of home entertainment, In the 1st Degree takes a big step toward that future. **– George and Ben Beekman**

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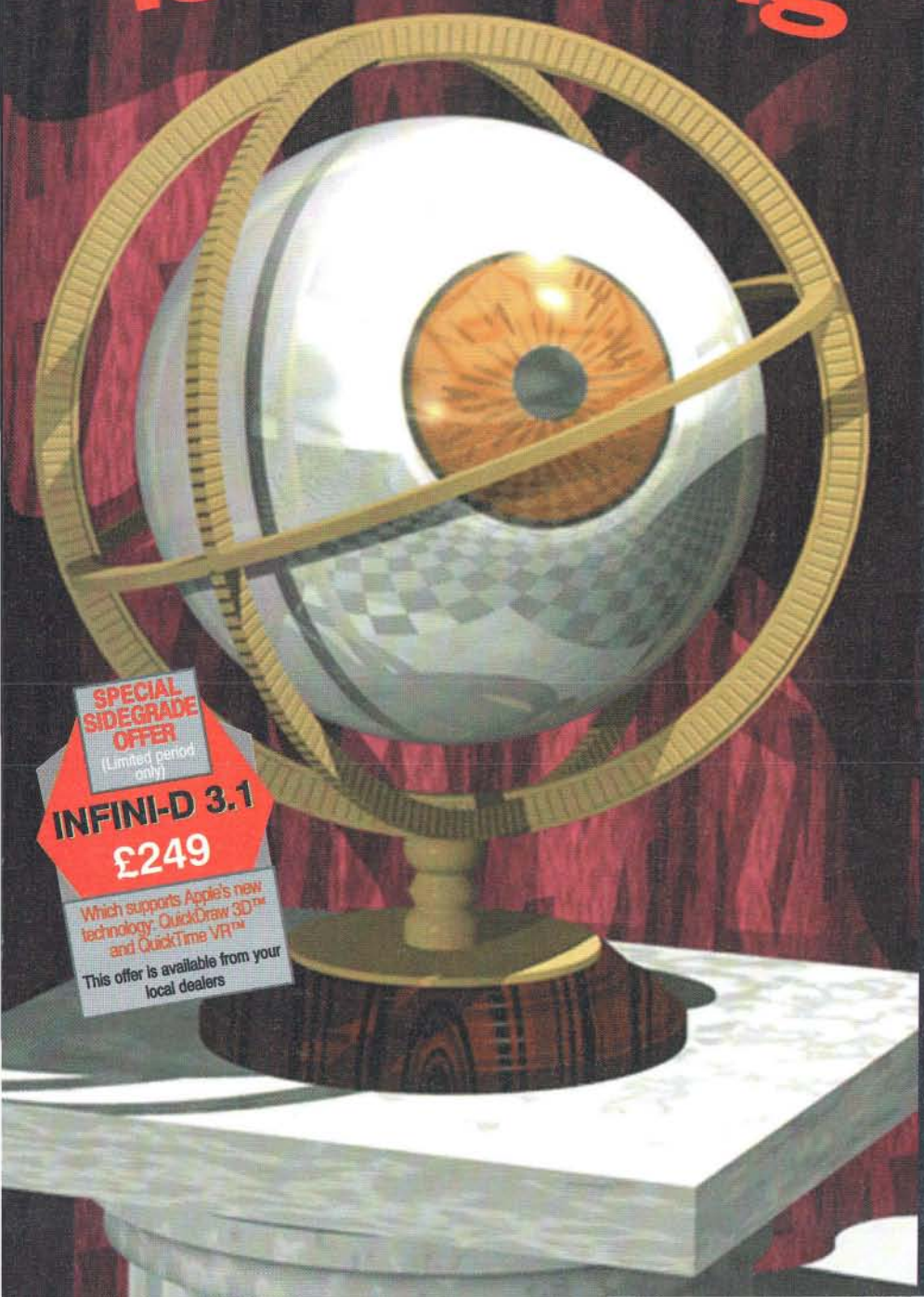

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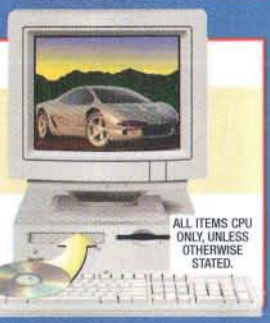

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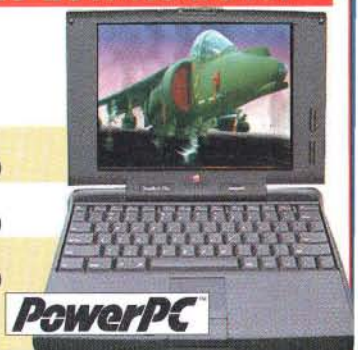

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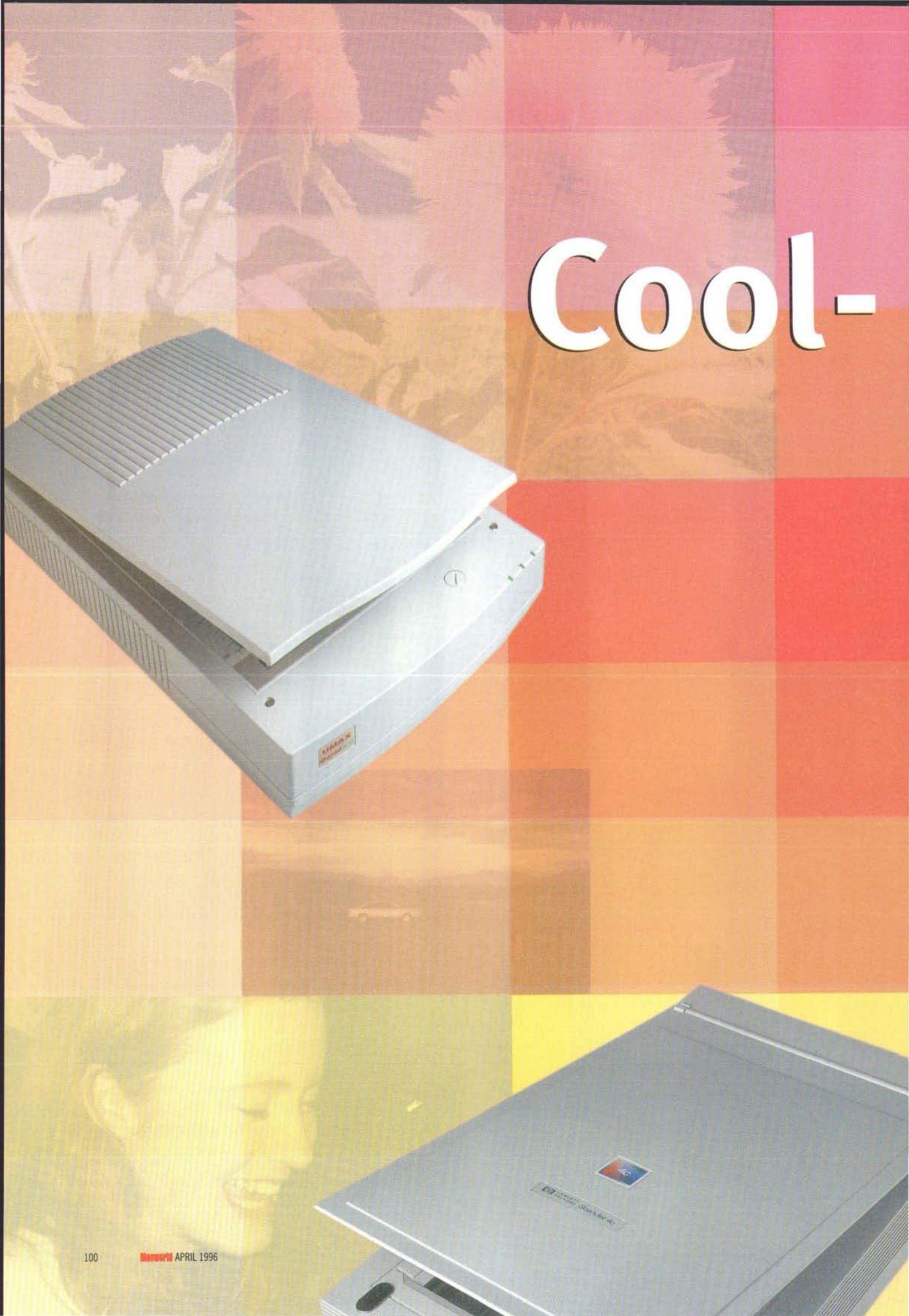
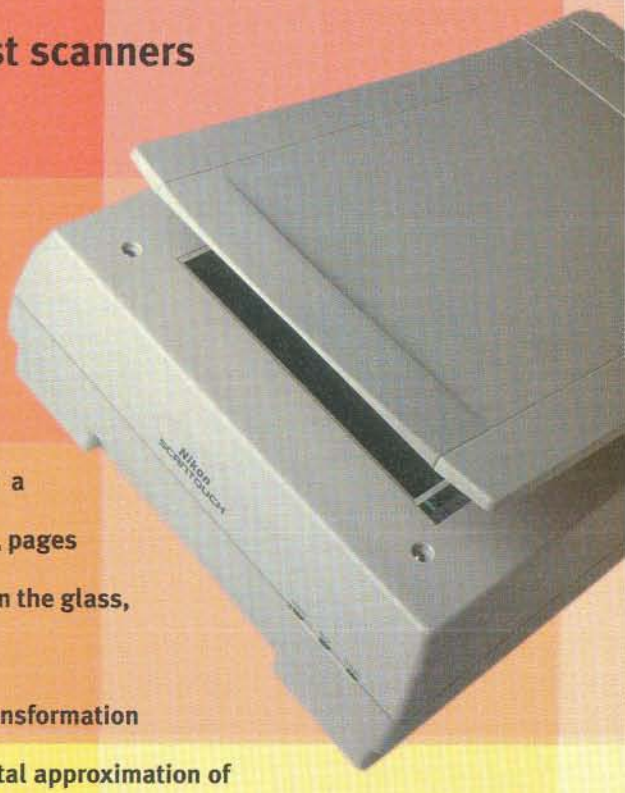
Cool-



price colour

True-life colour from the latest low-cost scanners

by Peter Stoller



Don't you wish you had a box that could magically transform any picture into an editable Macintosh file, right before your eyes? Well, for as little as £399, you can have a "magic box" that promises to make it almost that simple: a colour flatbed scanner. Colour photos, black-and-white line art, pages of text – heck, even transparencies, with an adaptor – put 'em on the glass, press a button, and presto! It's in there!

Yes, it is that simple – almost. The process by which this transformation happens is anything but simple, however. A scan is only a digital approximation of the original picture, after all. Details get lost or blurred, while interpretations of colours and text are inexact. Still, the best scanners do yield impressive results; they combine minimal loss and inaccuracy with maximum power and ease in compensating for the distortions.

continues page 102

The practical applications for colour scanners are growing, from desktop publishing to Web publishing to multimedia presentations. With improvements in hardware and software quality on the one hand, and prices dropping nicely on the other (two years ago, 300-dpi, 24-bit scanners cost £300 to £500 more than they do now), a colour scanner might just be your next peripheral buy.

Ah, but which scanner will it be? To help you decide, we examined 17 current models with street prices from about £399 to £1,345. Macworld Lab tested nine of them for image quality and speed, and then checked the software for power and ease of use.

Did we find high-end pre-press quality for £500? Nope. But we did find that, with some tweaking, you can get darned good scans at a damn good price.

A bit about bits

Out here in the real world, shades of colour and grey are continuous. Computers, we all know, are in another world; because they work with bits, they must break down the spectrum into discrete levels.

A 24-bit scanner divides each of its three primary colours – red, green, and blue – into 8 bits, or 256 levels. (In greyscale mode, a 24-bit scanner captures 256 levels of grey.) This (2,563) gives you 16.7 million possible combinations, that is, 16.7 million colours.

Theoretically, that ought to be enough data for a great picture. Unfortunately, it's not all good data; when you reach the 7th and 8th bits, accuracy takes a nosedive, resulting in lost or distorted details, especially in highlight and shadow regions. Furthermore, when you apply tonal corrections – adjusting gamma-curve results, brightness, and contrast – you reduce the size of your colour palette, resulting in lost data; you can change the colours you've still got, but you cannot work with what isn't there.

The solution seems pretty obvious: add more bits. That's exactly what most of these companies have done. All but the Apple, Canon and Microtek units (three of the least expensive products) are 30-bit scanners. At 10 bits per colour, they capture 1,024 levels of red, green, and blue, for over a billion colours total. The first 8 bits are fairly accurate, so the scanner can just junk the last couple of bits and leave you with superior 24-bit colour.

More significant, if the scanner performs tonal corrections of colour in hardware, you can take real advantage of the greater number of colours. When you expand part of the tonal range of a 24-bit image – say, to bring out shadow details – you compress it elsewhere, losing midrange and highlight details. A 30-bit scanner can use your instructions to select and deliver the best, full 24 bits of data for your needs,

continues page 104

Scanning for speed

Best overall scan time.
Products are listed in

When we clocked the scanners on their default settings for colour and greyscale scanning, the Epson ES-1200C was in the middle of the pack. We designated it our Editors' Choice, though, when we took into account the quality of its output along with its overall price.

	Bundled	Greyscale scan: Preview time	Greyscale scan: Scan time	Colour scan: Preview time	Colour scan: Scan time
Agfa StudioScan IIsi	Photoshop plug-in	15.7	25.2	26.8	60.6
Apple Color OneScanner	Ofoto 2.0	46.6	57.3	47.3	59.2
Epson GT9000	Photoshop plug-in	8.3	27.8	21.4	93.4
Hewlett-Packard ScanJet 4c	HP DeskScan II	17.3	19.0	18.0	77.7
Microtek ScanMaker IIsp	Photoshop plug-in	20.3	13.1	24.2	67.8
Mustek Paragon 1200SP	Photoshop plug-in	6.0	28.0	5.9	99.6
Nikon ScanTouch AX-1200	Photoshop plug-in	9.6	36.2	17.1	86.3
Tamarack ArtiScan Z1-600	Photoshop plug-in	9.6	19.6	13.5	52.2
Umax Gemini D-16	Photoshop plug-in	14.5	32.5	14.4	38.8

BEHIND OUR TESTS

We performed all tests using each scanner's default settings (with additional settings that gave the best colour accuracy). We tested the scanners with a Power Macintosh 7100/80 with 40MB of RAM and a 700MB internal hard drive. We used an Apple 16-inch display with bit depth set to 24. We allocated extra memory to Adobe Photoshop 3.0 to hold disk access to a minimum. – **Macworld Lab testing supervised by Mark Hurlow and Jeff Sacilotto**

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Scanning for the best highlights

Get real – that's what you want a scanner to do, right. Reproduce an image as closely as possible to real life. To test this, we input both a composite image and the IT8 colour-calibration swatch, and then compared the results with a Matchprint from a Cosfield scanner. We were most impressed by the results Epson and the Nikon scanners. The Microtek scanner is really bright but note how washed out the yellow marble appears.

Microtek ScanMaker IIsp

Nikon ScanTouch AX-1200

Microtek ScanMaker IIsp

Epson GT9000

giving your corrected image much smoother tonal continuity and greater detail retention.

True colours

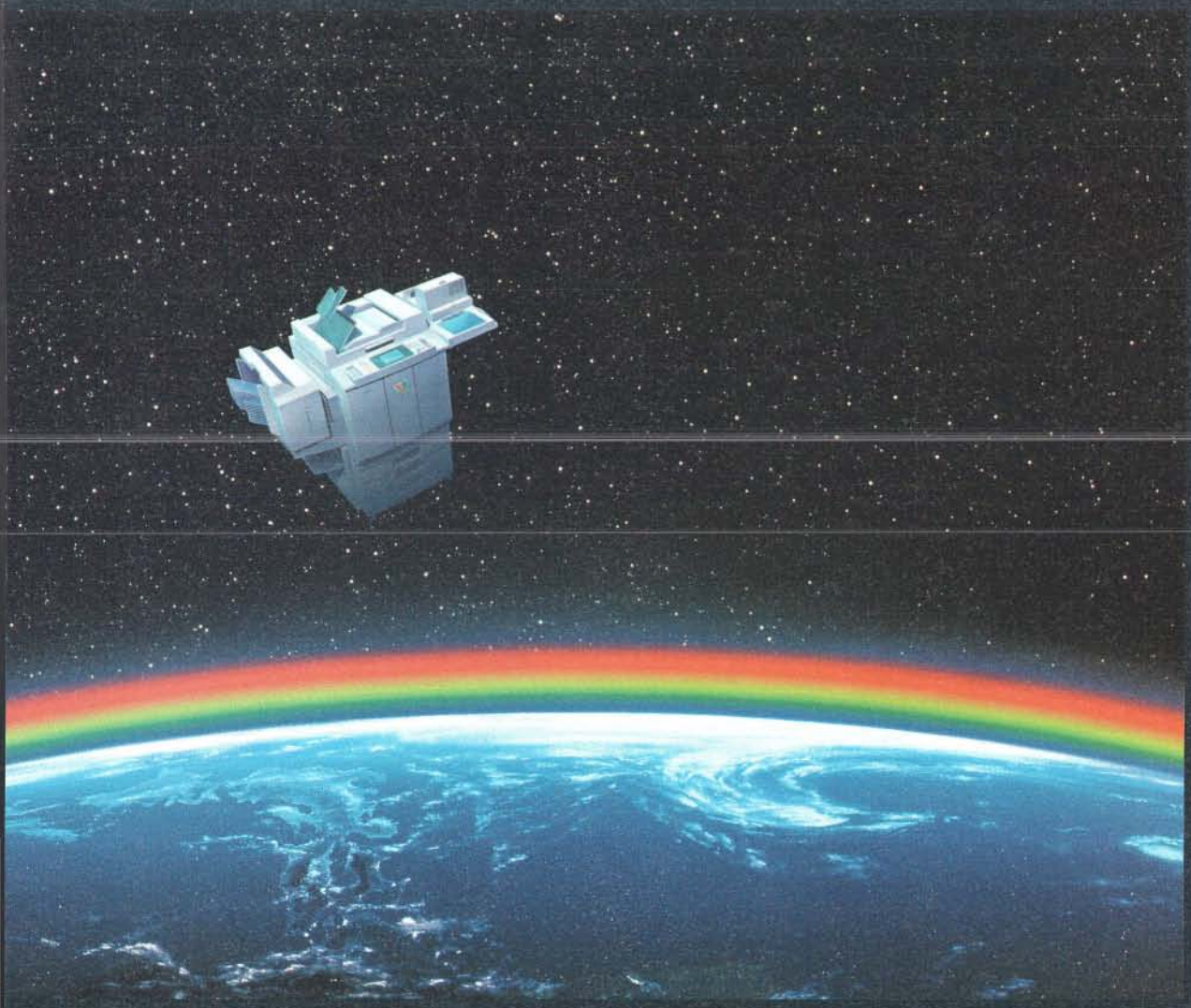
So, these 30-bit scanners have the potential to capture colours more accurately. But do they deliver? Yes and no. There's no question that they have an improved dynamic range – they capture grey and colour levels more accurately (see the benchmark "Scanning for speed"). And in our greyscale sensitivity test results, the 30-bit scanners (save for the Mustek Paragon 1200SP and Tamarack ArtiScan Z1-600) easily sweep the top spots.

Colour accuracy is more complicated than just capturing levels, though. There is no single, perfect model for accurately translating analogue colours into the digital world and back again. Every scanner compensates for this inadequacy differently, which means they interpret colours differently... and inaccurately. We checked how inaccurately by scanning a colour-calibration target, then using highly sophisticated colour-measurement equipment to compare the scans with the original target. You can see the results in the benchmark "The best colour with the least noise," but the problems are quite clear to the naked eye (see the sidebar "Scanning for the best highlights").

In all cases but one, the scanners erred on the dark side. They also had the biggest problems with the most saturated colours, including the darkest colours. This is visible as a loss of shadow detail. If the loss of detail is not too extreme, you can compensate in your scanning software or image-editing program. The Epson GT9000, for example, was sufficiently close for us to bring it into line with minimal difficulty. In the worst cases, though recovering shadow detail was an unrewarding chore.

Just from looking at the numbers, one would think the Microtek ScanMaker IIsp had colour accuracy nailed. The ScanMaker, however, is the exception: it erred on the light side of the gamut. True, the colours it captured were very close to the test target, and we easily

continues page106



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Cool colour tools

Company	Scanner	Star rating*	List price	Maximum scanning area (in inches)	Optical resolution (in dpi) a	Maximum bit depth
Agfa	StudioScan IIsi	✪✪✪/5.9	£935***	8.5 X 14.0	400	30a
Agfa	StudioScan IIsi	not tested	£935	8.5 X 14.0	400	30
Apple Computer	Colour OneScanner	✪✪/3.3	£590 a	8.5 X 14.0	300	24
AVR	8000/800	not tested	£395	8.5 X 14.0	300	24
Epson	GT9000	✪✪✪✪/7.2	£989***	8.5 X 11.7	600	30
Hewlett-Packard	HP ScanJet 4c	✪✪✪/6.1	£839	8.5 X 14.0	600	30
Microtek	ScanMaker IIsp	✪✪✪/5.0	£895	8.5 X 11.7	300	24
Mustek	Paragon 1200SP	✪✪/4.0	£569	8.5 X 14.0	600	30
Nikon	ScanTouch AX-1200	✪✪✪/5.8	£999	8.5 X 14.0	1200	30
Tamarack	ArtiScan Z1-600	✪✪/3.3	£799***	8.5 X 11.0	300	30
	Z1-1200	not tested	£935	8.5 X 11.0	600	30
	6000c	not tested	£399	8.5 X 11.0	300	24
	1200c	not tested	£499	8,5 X 11.0	600	24
Umax	Gemini D-16	✪✪✪✪/7.1	£1,345***	8.5 X 11.5	400	30
	Vista S6E	not tested	£495	£299	8.5 X 11.7	300
	Vista S8	not tested	£775	£499	8.5 X 11.7	400
	Vista S12	not tested	£895	£599	8.5 X 11.7	400

NP = Not provided by company. * Based on features, implementation, innovation, performance, reliability, ease of use, and value. (See MacUpdate section for full explanation.) ** Price depends

adjusted them to be nearly identical. However, the problem is with the colours it didn't capture. The ScanMaker IIsp lost a whole range of highlight colours, blowing them out to white. Nothing we could do would make it capture highlight detail.

Between those two extremes lie the "fixable" problems. Yet, again, the numbers don't tell the whole story; some types of colour errors are easier to correct than others, even when similar in degree. For example, it's fairly simple to adjust for consistently dark colours or an even colour cast, but it's hard to correct reds that are too orange without distorting accurate greens.

We found that the Nikon and Umax scans were easy to fix, while the Tamarack and Mustek scans weren't. Because such editing can be a lot of work, and you always run the risk of introducing worse problems than you fix, initial colour accuracy matters.

Resolving questions of resolution

Scanner vendors toss all sorts of numbers around when they talk about resolution: "Up to 4,800 by 4,800 dpi interpolated!" Forget about it. The only numbers that count are those for optical resolution; that's the level of detail the scanner's hardware really captures. Interpolation means the scanner or scanning software is generating data based on the real, captured data. That may smooth jaggies in line art, but it won't add a lick of detail.

Even the optical resolution figures can be misleading: "300 by 4,800 optical!" The first number is the horizontal resolution—that's the scanner's true optical resolution. The second number is the vertical resolution, which is (surprise) interpolated. Whether it's 300 by 300 or 300 by x, you've got a 300-dpi scanner.

So, how important is optical resolution? It depends on what sort of work you're doing. If you're scanning photos for a Web page or for output to an ink-jet printer, a 300-dpi scanner will capture more detail than you'll ever need. But if you're printing to high-resolution output devices, blowing up small originals, or reproducing line art, you should be looking for a 600-dpi or better scanner.

We found that, even at lower resolution settings, scanners with higher optical resolutions fared better at capturing details. Testing at 300 dpi, the 600-dpi and better scanners easily bested the 400-dpi and 300-dpi scanners, with Epson, Nikon, and Umax running win, place, and show. The weakest was the Apple scanners.

Resolution is also critical for optical character recognition (OCR): converting scanned documents into editable text. In previous testing we've found that, even with higher-resolution scanners, OCR programs

Warranty (in years)	Contact	Telephone	Comments
90 days	Agfa	0181 560 2131	The StudioScan IIsi gets good performance from its 30-bit, 400-dpi engine. Agfa's software is powerful and flexible, but could be easier to use.
90 days			
1	Apple	0800 127 753	The Colour OneScanner's anaemic software bundle and lacklustre performance would make it an unexceptional offer even if reasonably priced.
1	TekWare	01384 392 121	
1	Epson	01442 61144	The ES-1200C has great image quality, respectable speed, and good software, all at a reasonable price.
1	Hewlett-Packard	0990 474 747	The HP ScanJet 4c is a respectable performer in all categories, though not exceptional. Limited software is its greatest weakness.
1	Microtek	0171 587 3535	The ScanMaker IIsp is a shaky performer at best, especially when it comes to capturing highlight detail (it doesn't), but it's an option for the bargain hunter.
1	Principal	01706 832 000	The Paragon 1200SP is a disappointment, from its performance to its bare-bones manual. Proof that a 600-dpi, 30-bit scanner for £569 isn't a bargain.
1	DirekTek	0181 845 5969	The ScanTouch AX-1200 is a solid performer, but at this price it should be closer to stunning.
2	Magic Distribution Company	01734 588 686	The ArtiScan Z1-600's poor software, manual, and scanning performance make it hard for us to recommend it, even at its low price. So we won't.
2			
2			
2			
1	IMC	01344 872 868	The Gemini D-16 is unique in being both a 400-dpi and 800-dpi scanner, depending on the scanning area. But for several hundred dollars above its competitors, you'd better need that extra resolution.
24	1		
24	1		
24	1		

on bundled software. ***Priced at Photoshop package.

are too inaccurate to be practical for more than occasional use. Thus, we don't recommend buying any scanner primarily for OCR (see next month's professional OCR head-to-head for more information).

Loud and fast

Another problem with scanners is noise. No, not sounds you can hear, but random distortion in your scanned images; spurious specks of colour. Still, if you could actually hear this noise, you would want your neighbours to buy a Hewlett-Packard ScanJet 4c, or Epson GT9000. You might bang on the pipes if they used their Microtek ScanMaker IIsp after 11 pm, though; it introduced the most noise into its scans (see the benchmark "The best colour with the least noise").

OK, you don't want a noisy scanner, but you do want a fast one. The more scans you do, the faster you want your scanner to be, and the more prescan editing you do, the faster you want previews to be.

Fast previews are especially important. Scanner software gives you a quick, low-resolution preview of approximately how your high-resolution scan will look.

Most scanner software also lets you apply filters and tonal corrections at this point to reduce the amount of postscan editing in your graphics program, and (as discussed above) to make the best of 30-bit hardware. Also, by testing corrections on a low-res image, you can work more quickly than with a final scan.

Most of these scanners are reasonably speedy performers on both scans and previews, with the Umax (using the Photoshop plug-in) being the fastest for colour work. The Nikon ScanTouch AX-1200 offers fast preview modes if you are scanning in greyscale, but it also hinders prescan editing because it presents either lower-resolution or greyscale-only previews. Meanwhile, the Agfa StudioScan IIsi re-scans whenever you edit the preview, defeating the timesaving function of prescanning. The real clunker, though, is the Apple Color OneScanner using LightSource Ofoto's AutoScan mode. It took four minutes to do a grey-scale scan, and it refused to complete our colour scan because it couldn't automatically straighten the image. Even in manual mode, prescanning was snail-like.

Software plugged in

We've covered the quality of the raw image data and the speed with which you can get it. Just as critical is the ability to manipulate data as you scan it in: what can you do and how easily can you do it? That's where scanning software comes in.

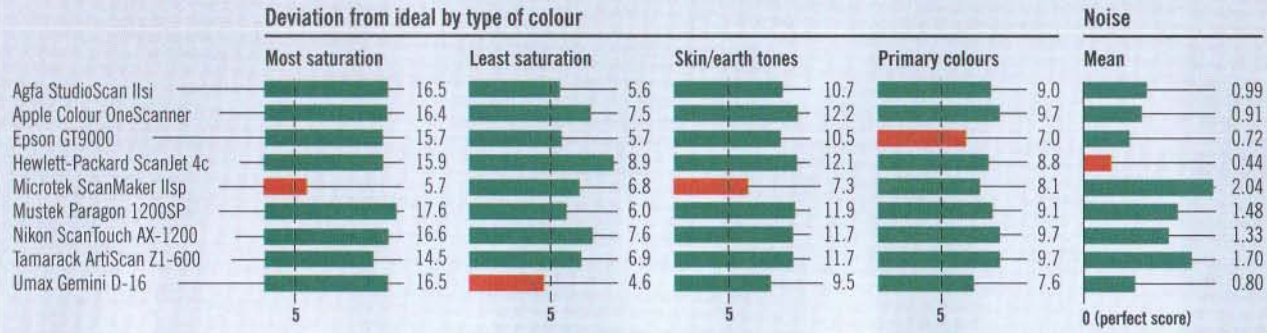
continues page 108

The best colour with the least noise

Best in test. Products are listed in alphabetical order. Shorter bars are better.

Finding the ideal colour match – even using an industry-standard colour-calibration tool – isn't easy. The numbers here show each scanner's variation from the ideal. The lower the number, the less variation from the ideal.

Most users won't notice a difference below 5. As for noise, any time you digitize an image, the scanner can unfortunately distort the image through electronic interference. The scanner's own amplifiers or CCD array can interfere with the scanning, as can random fluctuations in scanner light. This can be a problem if you're scanning images with minute changes in colour, or if you need to sharpen your images once they're scanned. Here the Hewlett-Packard ScanJet 4c gave the "quietest" performance.



BEHIND OUR TESTS

For our colour tests, we scanned the industry-standard colour-calibration tool, an IT8 swatch, which contains over 200 patches of carefully selected colours. We also measured each patch with Lightsource's Colortron Spectrophotometer, then measured the RGB values from each scan using Spectrum Analysts' IP Lab software. The RGB values were then converted to CIELAB values using the Colortron application. Finally, we compared the numbers in the uncorrected scans with the ideal.

To measure noise distortions, we made two scans of one image, five minutes apart. We applied the difference calculation in Photoshop, yielding a new file. From the histogram of the new file we extracted the mean. A "perfect" scanner would introduce no noise and deliver a mean of 0. – **Macworld Lab testing supervised by Mark Hurlow and Jeff Sacilotto**

The best scanning software lets you resize, zoom, and edit previews quickly and easily, and lets you control gamma curves and the white point, midpoint, and black point graphically and by plugging in numbers. The best software also offers a densitometer, measures colour values and displays a histogram for viewing and editing tonal ranges, offers sharpness controls, prevents moiré patterns in scans of previously halftoned images, and includes colour-management software to help with input/output matching.

Agfa's FotoLook has a complete, powerful set of tonal-correction tools, and it takes full advantage of the 30-bit hardware. If only the tools were easier to use and more clearly documented. Agfa also includes FotoTune Light, a basic colour-management system; FotoFlavor, a flexible Photoshop filter plug-in; and FotoSnap, a vastly simplified version of FotoLook.

Umax's MagicScan and MagicMatch software are comparable to Agfa's software in power and are easier to use. The tools closely parallel Photoshop's, so the learning curve is low for experienced Photoshop users.

Despite the ScanMaker IIsp's problem with highlights, Microtek has got the scanner software interface right with its new ScanWizard plug-in. All the critical features are there, easily and intuitively accessible and well documented.

Epson offers three packages; the base unit, bundled with Photoshop, and bundled with Photoshop Lite and Xerox OCR.

We've heard complaints about Hewlett-Packard's lack of a Photoshop plug-in, but we had no problems using HP's TWAIN driver. (TWAIN is a driver standard from Hewlett-Packard that companies use to create their own drivers.)

Apple's scanners come with Ofoto, a program that excels at automated image correction but has frustrating limitations in manual operation. Apple stops there: no plug-in or TWAIN driver. The plug-in that comes with the Tamarack scanner is a tiny, nonresizable preview window with awkward controls, no auto-adjustments, no sharpness filter, no progress bar, and inadequate documentation. Mustek's plug-in is better – but not by much.

Some vendors offer enticing bundles. Most of them include an image-editing program such as MicroFrontier Colour It or Adobe Photoshop Lite (a limited edition of Photoshop lacking several print-related features).

Other vendors include the full version of Photoshop, and several offer a choice at two different prices. Other extras range from OCR programs to Kai's Power Tools; these are useful, but not a determining factor when scanner shopping.

The last word

The less expensive scanners didn't strike us as real bargains. Apple's Colour OneScanner costs more and offers less. The Microtek, Mustek, and Tamarack scanners were simply underwhelming, although Microtek's Photoshop bundle is so cheap, it's tempting to buy the package for Photoshop and think of the scanner as a £170 extra.

While several of the other scanners performed well in our tests, it was not hard to pick a winner. The Epson GT9000 gets our nod. The Umax Gemini D-16 ran neck-and-neck with the Epson in performance but can't compete on value.

It's not the cheapest but the Epson GT9000 has the best image quality, respectable speed, and good software, all at a reasonable price. If you don't need the software, you can get the scanner without it for even less. MW

Editors' Choice

MID-RANGE SCANNERS

We looked at colour accuracy, resolution, software and price when we compared colour flatbed scanners

✪✪✪✪/7.2 **GT9000** This 600-dpi, 30-bit colour scanners offer the best balance of performance, package and price of all the scanners for about half the price, but that doesn't make them a better deal, and even the pricier units didn't outperform the GT9000 **Company:** Epson, 01442 61144 **List price:** £989.

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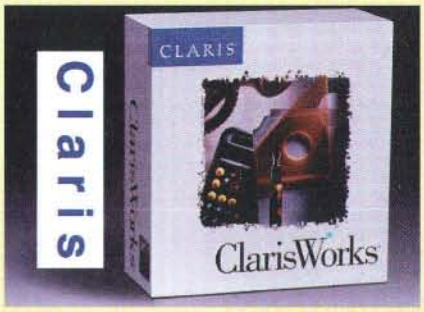

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Ace servers

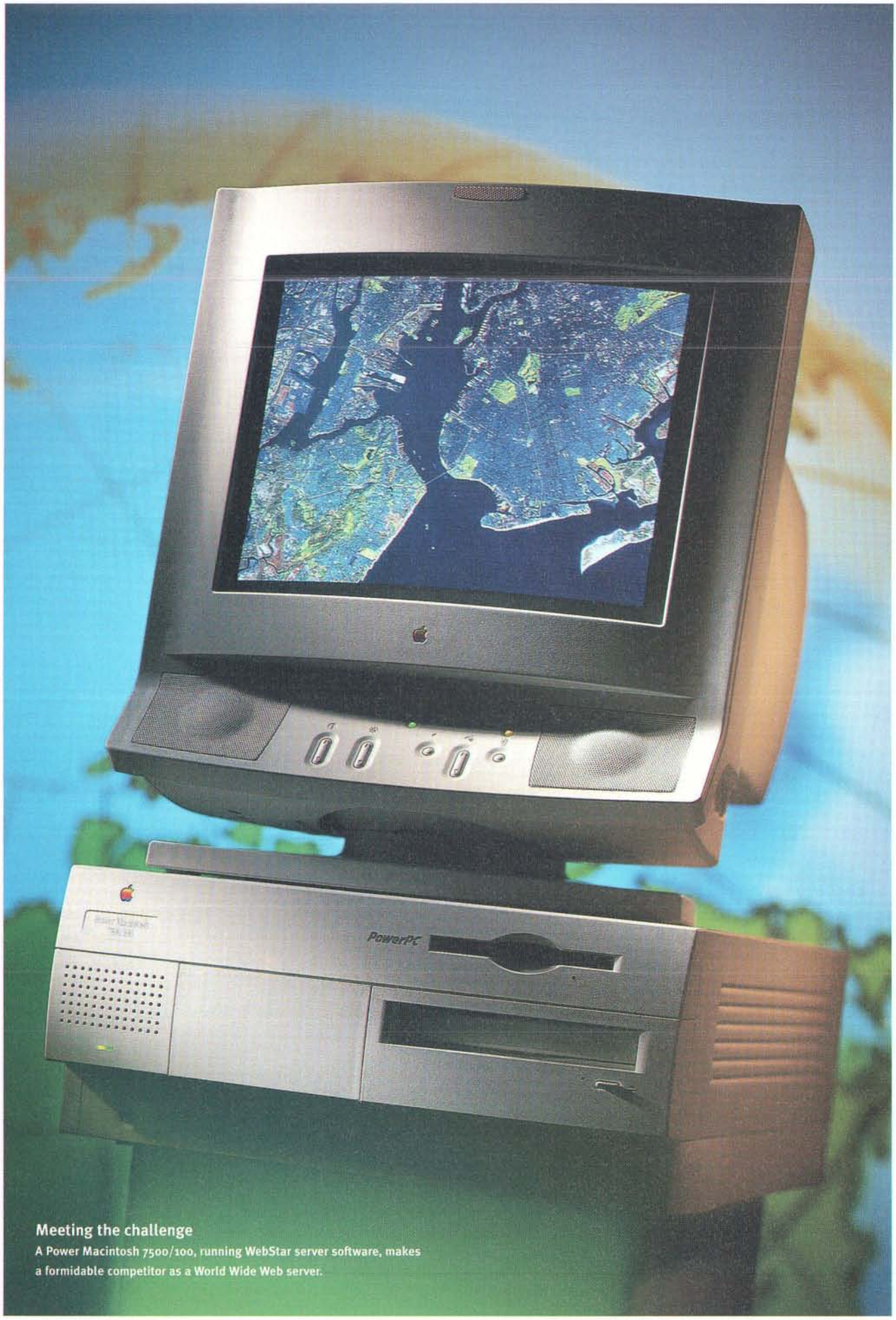
Forget Unix – build your Web site on the Mac

by Mel Beckman

You say you're feeling queasy because your boss just stopped by your office and asked, "Where's our Web server?" You feel oppressed because you're supposed to get online order processing, technical support, and periodic video updates of the office aquarium up and running by Friday? You think that your life is over because this means you finally have to learn Unix? Well, cheer up, Bucko. You are about to read everything you need to know to get a Web server set up by Friday – perhaps not this Friday, but one in the near future.

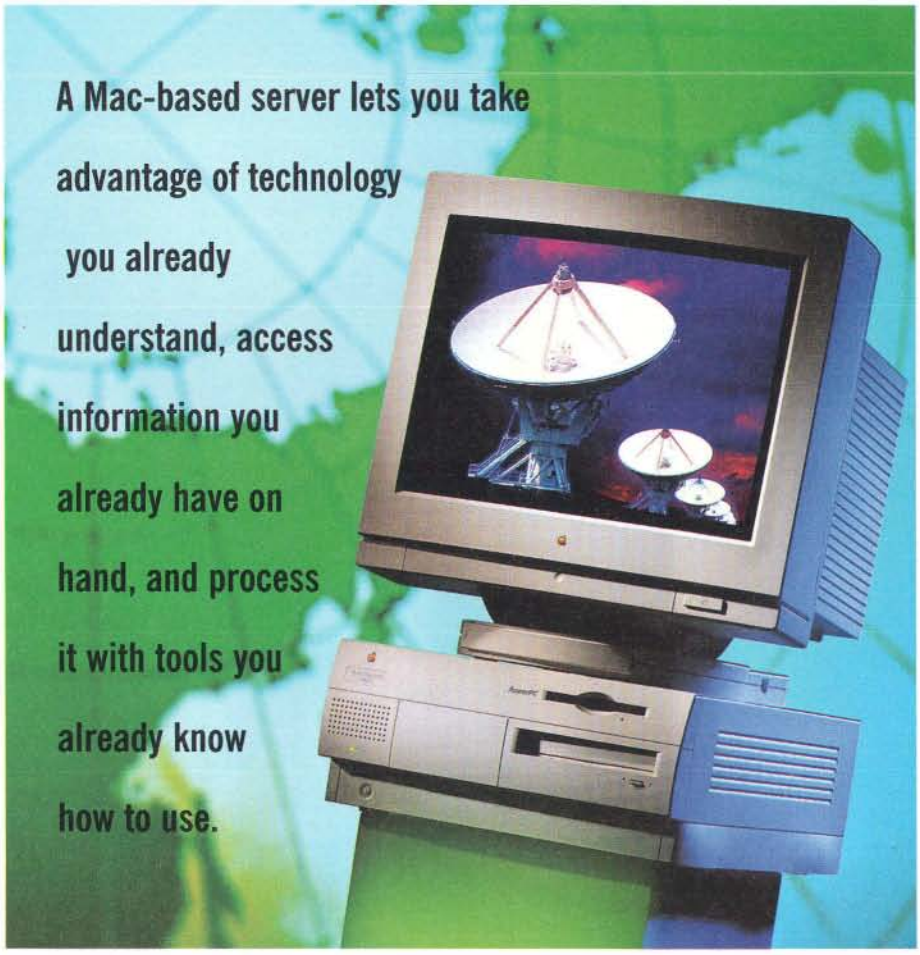
All you need is your Macintosh wiles, and a friend in the accounting department to funnel a little extra money your way. Conventional wisdom holds that you get your company online by renting space on a Unix Web server from your friendly neighbourhood Internet service provider.

continues page 114



Meeting the challenge

A Power Macintosh 7500/100, running WebStar server software, makes a formidable competitor as a World Wide Web server.



Such providers have a fast connection to the Internet and an experienced staff happy to charge you good money to set up and deliver your corporate home page. While this approach works, you're stuck with whatever server technology your provider supplies, which usually means maintaining (or paying a Web guru to maintain) your site using FTP and archaic Unix commands. And if you want to do fancy things like custom orders, secure commerce, database retrieval, or real-time multimedia (for example, your boss's GuppieCam), you're likely out of luck.

But wait. Shouldn't your Mac be able to do this? A Web server is, after all, nothing more than a program running on a computer that has a full-time TCP/IP Internet connection. With TCP/IP built into System 7.5 (it was previously available as a System 7.1 extension), the Macintosh should be a natural at home-page delivery.

A Mac-based server lets you take advantage of technology you already understand, access information you already have on hand, and process it with tools you already know how to use. Some servers even take advantage of the Mac's graphical interface to make Web-server setup point-and-click simple. But can a Mac running one of the several server products now available really do the job a Unix box can?

To find out, Macworld Lab compared five Mac Web server products – Quarterdeck/StarNine's MacHTTP and WebStar, httpd4Mac shareware, InterCon's InterServer Publisher, and Tenon's MachTen – for performance, ease of use, and features, in a range of scenarios running on a Power Macintosh 7500/100, an excellent choice for server hardware. And we tested a Unix server, the NCSA HTTPd running on an IBM RS/6000 Model 250, to see if the Mac can compete in the real world. The Mac makes a good showing, although it doesn't do everything as well as a Unix server. It's certainly a contender worth some serious attention.

WHICH MAC IS RIGHT? Just about any Macintosh can run TCP/IP, so you might think any Mac would do as an Internet server. The processing demands placed on an Internet server, though, require at least a 68040 processor, and a Power Mac is really a better candidate for handling medium to heavy traffic.

Which OS version and TCP/IP support you use also affects performance. MacTCP has some painful limitations. First, it is not PowerPC-native, so it runs at some disadvantage on Power Macs. Second, it supports only 64 simultaneous connections. Most server applications reserve some connections for other uses, reducing that number to 50 or fewer. This may sound like a lot, but modern Web browsers often open 5 or more connections to download text and graphics in parallel, so 50 connections translates to no more than 10 simultaneous users.

Open Transport will help Apple is replacing MacTCP with its new protocol stack, Open Transport, which runs native on Power Macs, has no connection limitations, and generally performs much better than MacTCP. However, at this writing Open Transport is having a troubled birth, with problems ranging from incompatibility with existing MacTCP-based applications to unreliable operation and system crashes. None of the currently available Mac Web-server products have been updated to work reliably with Open Transport, although all vendors say they will have Open Transport–compatible updates by the time you read this.

Apple's integrated solution An alternative to buying off-the-shelf software and hardware and building a server yourself is to use one of the Apple Internet Service Solution (AISS) bundles, which combine a selected Workgroup Server hardware package with a CD-ROM of Web-server software and utilities. The software includes Quarterdeck/StarNine's WebStar and a wide array of utilities. We did not test the current AISS offerings, as Apple will replace those products with new bundles in the near future.

Making the connection The final platform issue you must settle is your physical Internet connection. For medium-speed digital connections, such as Leased-56, Switched-56, and ISDN lines, you can connect via your Mac's serial port to a data service unit (for Leased-56 and Switched-56) or to a terminal adaptor (for ISDN). You must run a serial IP connection tool, such as MacPPP, to carry TCP/IP traffic to your access provider.

The serial-port approach may be inexpensive in the short term, but can buy you problems down the road. First, unless you're running a Power Mac, your Mac's serial port likely can't sustain speeds in excess of 38.4 Kbps. Only Power Macs and some AV Macs have high-speed serial ports capable of 128 Kbps or more. You may not notice this problem until two or more users try to access your server simultaneously. Second, even with a high-speed serial port, your Mac can get bogged down just handling the TCP/IP transport.

A better approach to Internet connectivity is a standalone IP router connected via ethernet. You need an ethernet-capable Mac, but no special software. A router costs more – from £995 to £2,000 – but relieves your Mac of Internet-connection chores. A router can also provide automatic data compression, resulting in higher throughput, and can serve other machines on your LAN at the same time (see the sidebar "Planning for the right Web server").

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Plan for the right Web server

Before you run out and assemble a server, you need to consider several important factors: the audience you intend to serve, the content you want to deliver, the Internet connection you can afford, and the minimum performance you need in order to succeed.

Who is your target?

As with other media, you're trying to reach a particular audience with your Web server. It could be current and prospective customers, business partners, like-minded interest groups, or even your competitors.

You should determine which of three kinds of visitors you're targeting: occasional visitors may browse your page lightly and never return; regular visitors may return to your page repeatedly to obtain some service, such as product information or technical support; frequent visitors, such as people in your own organization, may use your Web page as a regular part of their information-processing environment. If you expect only occasional visitors, you can get by with a much less capable Web server than if you offer order-entry services and real-time video.

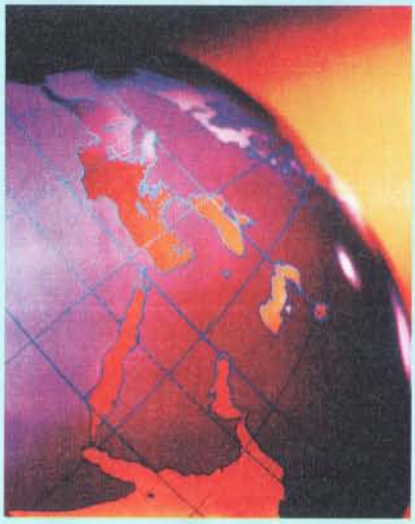
Sensitivity about speed You should also consider the speed at which your audience will be connecting to you. Most home Internet users still connect via modems at the relatively slow rates of 14.4 to 28.8 Kbps. Small-business users frequently have medium-speed digital connections that range from 56 to 128 Kbps. Corporate users can often connect at speeds of 256 to 1544 Kbps or higher. Users on your local LAN will be accessing at 10 Mbps or even 100 Mbps.

This last group is an oft-overlooked audience. Web serving isn't just for the Internet; you can use in-house private Web serving to quickly roll out client-server applications and internal information-delivery systems. User-connection speed determines how powerful your server hardware and Internet connection must be, and how data intensive your content can be. Your Internet connection should be fast enough to accommodate two or more simultaneous users at the fastest user speed you expect. This means that two users can move data over the link simultaneously, even when several times that number of users actually are viewing the site. Most of the time those users will be reading the page, not moving traffic.

Content matters The simplest Web page presents primarily textual information, with graphics incidental to the content. If your content falls into this category, you can expect to serve a great many users with very modest hardware and Internet speeds.

More sophisticated Web pages present integrated text and graphics, with important information contained in the graphics. You will need moderately fast hardware and Internet access, and you should expect to support fewer simultaneous users than you could with text-only content.

Some Web pages combine stock text and graphics with information retrieved from



one or more databases. The Web server handles the task of querying the necessary databases and formatting the results for presentation to the end user as an HTML document. Such additional processing may not result in more information going to the user, and hence there's no need for a faster Internet connection. But it will require a beefier hardware platform to run Web-serving and database software simultaneously.

The most sophisticated Web pages include the ability to deliver multimedia information, such as audio and video files. Such servers may require standalone applications to deliver a multimedia data stream in real time. For this application, you need hefty hardware and high-bandwidth Internet pipes.

Connection alternatives If money were no object, you'd get a 155-Mbps fibre-optic Internet connection and be done with it. But money is often a big object, and because your Internet connection fee is a recurring bill, connection speed will likely be the single largest cost factor you consider.

Today you can choose from a half-dozen Internet-connection methods, with varying trade-offs between cost and speed. The most important attribute of any Web connection is dedicated access. For your server to be continuously accessible to the outside world, your Internet connection must be up 24 hours a day, every day. The second most important attribute is connection speed. The minimum speed to consider is 56 Kbps, which requires a digital link of some sort. This rules out analogue modems as an alternative.

Some low-cost switched (dial-up) digital links, such as ISDN, incur usage costs from the telephone company, ranging from a penny per minute to long-distance telephone rates. These costs may make continuous connections impractical. For example, an ISDN connection at, say, a penny per minute would cost £14.40 per day, or £432 per month. You could easily buy a nonswitched digital link for one month's costs.

A workaround is the virtual dedicated connection: your access provider automatically dials up your server whenever someone on the Web wants to look at your site. Digital call setup takes only a second or two, and the line can stay up until several minutes of inactivity have passed. Such a connection has the appearance of a dedicated connection but incurs costs only when it's actually moving data.

Whatever connection you use, secure competent technical help for installation and configuration. Digital links can be difficult to get working, but once they're in place they're usually reliable and trouble-free. Most access providers include installation support in their start-up fees.

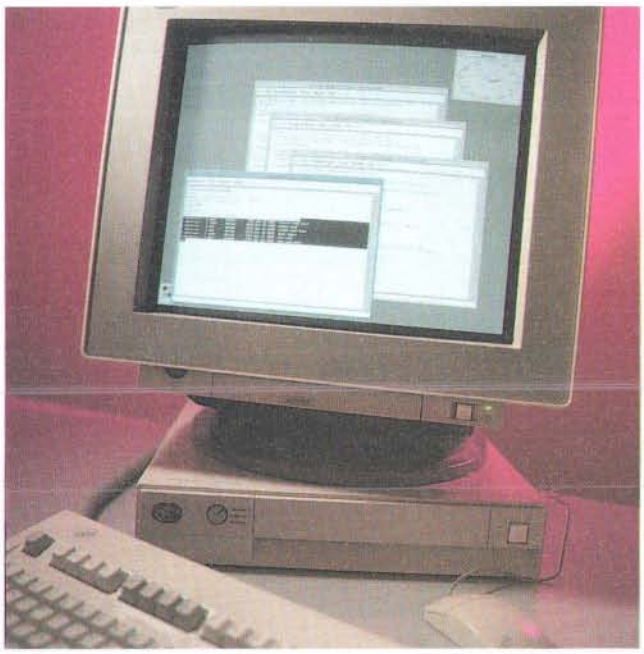
An alternative to buying your own digital connection is to place your server hardware on your access provider's LAN. Called colocation, this technique lets you share the access provider's high-bandwidth Internet connection while eliminating the fixed monthly cost of a digital link. The access provider still charges you for Internet access, usually by gigabyte of information your server delivers. The disadvantage of this approach is the inconvenience of maintaining your server remotely. You have to run an FTP server application alongside your Web server for maintenance access.

Which software is right?

OK, all your hardware ducks are lined up, and you're ready to go shopping for server software. There are choices here, too. You can go with shareware or a commercial product, a Mac-oriented product or one descended from Unix lineage. You can spend a little or a lot. It all depends on your skills and budget.

Consider performance To see how Mac Web servers stack up against each other, as well as against the Unix competition, we tested all the servers on a Power Mac 7500/100 under MacTCP.

We also set up and tested a comparable Unix system (a 66MHz PowerPC 601–based IBM RS/6000 Model 250 running NCSA HTTPd). The commercial Mac products all fared well, although not as well as the Unix product; under a load of five simultaneous users, the Macintosh servers slowed noticeably while the Unix box hardly took heed (see the benchmark "For speed, Unix is champ").



The Unix contender This 66MHz PowerPC 601–based IBM RS/6000 Model 250, running NCSA HTTPd, beat the Mac in speed tests – but at a high price in features and ease of use.

The freeware and shareware servers suffered serious reliability problems under a five-user load, even when configured for the maximum number of users with 16MB of application memory (httpd4Mac also failed with two to three users on the complex HTML document). They would crash unexpectedly when too many TCP connections were attempted. Of the commercial products, MachTen was fastest, followed by InterServer. WebStar ran nearly as fast, however, with much more polish.

Ease of use If you're a Mac guru who loves to experiment, there are two shareware products on the market: Quarterdeck/StarNine's MacHTTP and Bill Melotti's httpd4Mac. Their names come from HTTPd, the HyperText Transport Protocol Daemon, which runs on Unix systems. Both products derive from the first widely available Unix Web server, the NCSA HTTPd, which we tested for comparison. True to their origins, these products get configured via Unix-style text files. There are lots of options to choose from, so the configuration files are large and confusing. If you make a typo, expect to spend a good deal of time diagnosing the problem; no friendly Mac-style error reporting here.

For Unix-at-heart Macintosh users, there are two extant versions of Macintosh Unix, Apple's A/UX and Tenon's MachTen. You should consider A/UX only if you're already running it for some reason (such as on an Apple server). But keep in mind that A/UX won't run on PowerPC hardware, so you're limiting your future expansion options.

If you just plain like Unix, but don't want to sell your soul (or your Mac hard drive) to it, consider MachTen, which runs as an application under the Mac OS. MachTen consumes prodigious amounts of disk space (plan on 100MB) but comes with a built-in Web server (NCSA HTTPd). Although you configure the Web server with text files, just like any Unix server, because you're running inside a full-fledged Unix environment you can use all the same tools and accessories enjoyed by the big Unix boys and girls.

If you're not an expert and just want to get a reliable server up and running, go straight to the commercial products. At this writing two are shipping – WebStar and InterServer Publisher – and more are on the way from other vendors. You get reliable, easy-to-use products with telephone and electronic technical support, and more features than the shareware cousins offer.

Features you need Speaking of features, price and support shouldn't be your only selection criteria. After all, you're spending a fair sum on hardware and Internet connectivity, not to mention the investment of time to get everything set up. Consider some features that might be important in your application, and make sure your server choice supports them (see the table "Serving up Web servers").

The most important feature, if you're planning on doing any back-end processing, is Common Gateway Interface (CGI) support. CGI lets your HTML document invoke Mac programs and scripts to process user information, such as a query request, and return results, such as a database extract.

To their credit, the commercial products we tested all include sample CGI scripts, and you can find a wide range of others online. WebStar's excellent CGI library puts it above the competition, however. InterServer Publisher has CGI examples, but you have to go look for them, as the documentation has not a word on the subject.

Other important features are configurable MIME (Multipurpose Internet Mail Extensions) settings and URL suffix mapping. When delivering data to a browser, your server passes along the type of data – text, GIF or JPEG graphics, sound, video – so the browser can present the data appropriately. MIME settings and URL suffix mapping let you configure your server to support new kinds of data as they become available. For example, if you want to serve PDF files, you can establish a MIME type for Mac PDF files, or an URL suffix map for file names ending in .pdf, so that browsers are informed when you're delivering a PDF file. WebStar and MachTen support suffix mapping, although WebStar is the only one with a GUI configuration interface with the feature. InterServer Publisher and httpd4Mac lack the feature.

Access security is another capability you should consider carefully. Servers with access security usually support one or both of the stan-

continues page 118

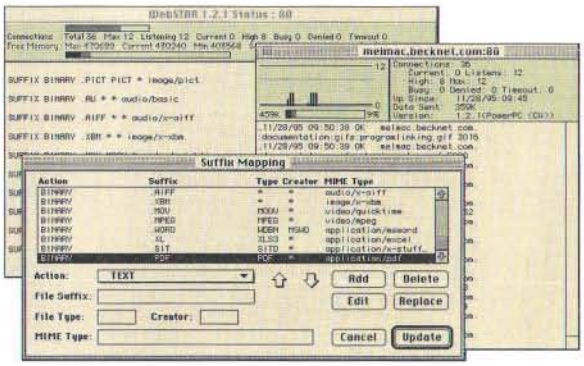
If you're not an expert and just want to get a reliable server up and running, go straight to the commercial products. At this writing two are shipping – WebStar and InterServer Publisher – and more are on the way from other vendors.

dard Web features, realm control and allow/deny control. With realm control, you organize folders and documents into groups called realms. You can create a list of authorized users and passwords and grant them access to particular realms. When users try to access a secured realm, their browser prompts them for a user ID and password.

In contrast to realm control's active protection, allow/deny control manages access passively, based on the user's IP address or domain name.

This lets you control access at the server level, based on where the request originates. Both kinds of security controls are useful, and you'll probably want both. All the products except httpd4Mac have realm and allow/deny control, although WebStar and InterServer Publisher are the only products with a point-and-click security interface.

If you want your server to support more than one organization, two features – multiple servers and multihoming – will be important to you. Multiple-server support lets you run two or more copies of the server software on the same Mac. Users must access these servers through different TCP ports and must include the port number in their URL if it differs from the default of 80. For example, you might run a public server on TCP port 80 and a private server on port 5555. Users would use http://www.yourcompany.com to access the public server and http://www.yourcompany.com:5555 to reach the private one.



WebStar lets you remotely monitor and control one or more WebStar servers. In addition to providing real-time use statistics, including a traffic meter and traffic-history graph, WebStar lets you change any of a server's operational attributes, such as MIME types and suffix mapping.

Multihoming lets you run servers with completely different domain names, such as www.acme.com and www.coyote.com, by giving each domain a separate, unique IP address. MacHTTP, WebStar, and MachTen all let you run multiple servers. Currently only MachTen, the Mac Unix server, supports multihoming, although you can add the capability to native Mac servers using a third-party product called HomeDoor (see the sidebar "World Wide Web–server software accessories").

Performance controls The last major feature set is performance controls. Because the Mac OS doesn't support pre-emptive multitasking, you may have problems running a server with many simultaneous users or with CGI programs executing in the background. Two features help here: threaded execution and CPU-usage limits. Normally, when a single HTTP request comes in for a particular HTML element (such as an icon), the Mac server must completely process that request before it can take the next one, slowing access for other users. The Mac OS now has built-in support for threaded execution, which lets a single application, such as a Web server, do more than one thing at a time. In this case, threads let the Web server accept and process HTTP requests in parallel. Only WebStar and MachTen support threads.

A related problem is balancing time between Web server and CGI program execution. It's possible for a Web server to hog the CPU so CGI

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MW LAB

FOR SPEED, UNIX IS CHAMP

Mac servers tend to slow down with even a few simultaneous users, while the Unix server shows virtually no performance degradation even under the heaviest test load. This is likely due to the performance bottleneck imposed by MacTCP. Apple claims this bottleneck will disappear with Open Transport version 1.1. Our tests were not intended to stress each server to the breaking point; they looked at a moderate load (for Mac servers) of up to five simultaneous users continuously retrieving data. Two servers – MacHTTP and httpd4Mac – could not sustain even these moderate loads without crashing. Surprisingly, MacHTTP ran faster than its commercial descendant, WebStar, but speed counts for little if you don't survive the journey. InterServer was the fastest Mac server (aside from MachTen, which runs Unix on top of the Mac OS) but still showed significant performance degradation as the load increased.

Best in test. Shorter bars are better. All times are in seconds. Products are listed in alphabetical order.

Large-Graphic HTML Document

Time to download document with simultaneous, continuous traffic over one or two connections per user, including only one TCP/IP connection per user.

	1 User	2 Users	3 Users	5 Users
httpd4Mac freeware	13	16	20	*
InterCon InterServer	7	8	10	14
NCSA HTTPd (Unix)	7	7	7	8
StarNine MacHTTP	11	11	12	15
StarNine WebStar	12	14	14	16
Tenon MachTen	7	7	9	13

Complex HTML Document

Time to download text-and-graphics document with simultaneous, continuous traffic over five or more connections per user, including at least five TCP/IP connections per user.

	1 User	2 Users	3 Users	5 Users
httpd4Mac freeware	15	*	*	*
InterCon InterServer	8	9	11	14
NCSA HTTPd (Unix)	6	6	6	7
StarNine MacHTTP	9	11	12	*
StarNine WebStar	9	13	14	16
Tenon MachTen	8	9	10	13

*Server failed.

BEHIND OUR TESTS

For the Unix reference platform, we chose IBM's PowerPC-based 66MHz RS/6000 Model 250, because this system uses the same 601 PowerPC processor found in most Power Macs. We ran NCSA's freeware HTTPd server software because it's a popular package in the Unix world. We tested the Mac servers on a 100MHz Power Mac 7500 with 24MB of RAM and MacTCP.

Our test documents consisted of a set of HTML files containing text, graphics, and a mixture of text and graphics. We grouped the HTML pages by total size in bytes to form small, medium, and large test sets. We ran each server with one, two, three, and five simultaneous users running the Netscape Navigator 1.12 browser; we recorded the total time each test document took to download. We ran each test suite over a 10-Mbps ethernet LAN, a 1.544-Mbps digital T1 connection, and a 128-Kbps ISDN connection.

We found that performance was proportional between test sets of different sizes and over different network connections, so we report here only figures for the largest test sets, accessed via a LAN connection. We also found that performance for large HTML text documents is limited by the browser used, so we only report times for graphics-intensive and mixed-text-and-graphics documents.

– Macworld Lab testing supervised by Mel Beckman and Lauren Black

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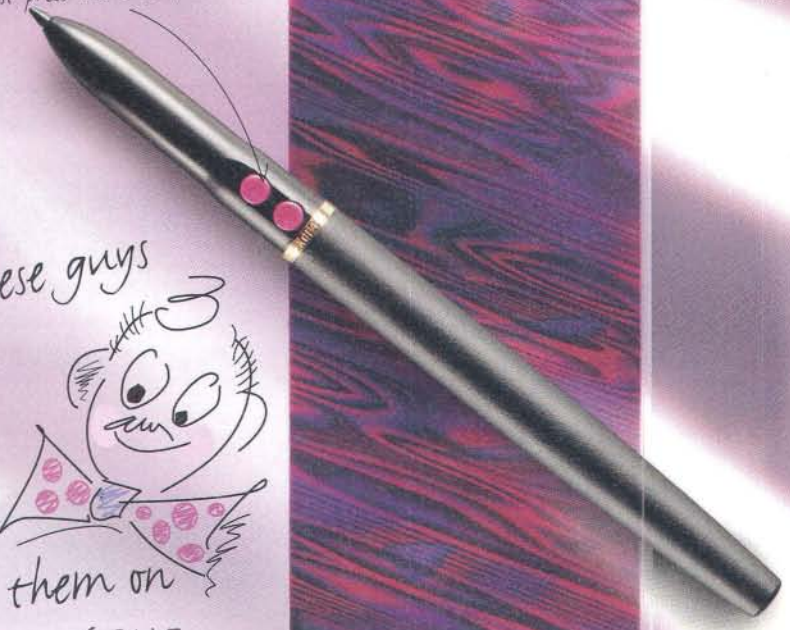

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Summagraphics

programs get very little time to execute. The resulting glut of slow-running CGI programs can bog down the whole system. A server that can limit its CPU usage to a predefined value mitigates this problem, ensuring that CGI programs get enough time to execute quickly. MacHTTP, WebStar, and MachTen have this capability.

A slew of other features may or may not be important to you. Image map support lets you put clickable images in your Web pages. File aliases enable you to put Mac alias files into your Server folder to reference data elsewhere on that volume or on another mounted volume. Folder indexing automatically creates HTML indexes of whole folders to simplify serving many files. Access logging records every user transaction for later statistical analysis. InterServer Publisher and MachTen include add-on servers for FTP and Gopher. These are worthwhile additions if you are planning to set up a complete Internet presence.

Each product has its strengths and weaknesses. MacHTTP is feature laden and well documented, but fails under a heavy load, ruling it out as a serious commercial server. InterServer Publisher, while fast and functional, lacks important features, such as suffix mapping and configurable MIME types.

Bill Melotti's httpd4Mac is a valiant effort at minimalist shareware, but with virtually no features httpd4Mac can do little more than deliver simple Web documents. MachTen is actually an entire Unix implementation that happens to contain a Web server (NCSA HTTPd). Because it is real Unix with an embedded C compiler, it can run any Unix-originated CGI program in just about any language. Because MachTen has its own TCP/ IP stack that replaces both MacTCP and Open Transport (with good results), it supports multihoming. But don't even consider MachTen unless you have some basic Unix-system–administration skills.

WebStar is a polished product with a rich feature set. It delivers on everything it promises: complete, clear documentation; point-and-

continues page 122

World Wide Web-server software accessories

Third-party vendors offer a wide range of utilities that complement Mac-based Web servers. For many specialized needs, these add-ons can be essential to the success of your Web site. Here are a few of the most notable to consider – some appear in Apple's just-released Internet Server Solution 2.0 package (see above).

OpenDoor's HomeDoor ($399; **http://www.opendoor.com/HomeDoor/HomeDoor.html**. OpenDoor brings HTTP multi-homing to any MacTCP-compatible Web server. This patch to MacTCP lets you assign an individual Macintosh up to 255 different IP addresses, and you can map those addresses to specific URLs in the server. This lets you support multiple, unique domain names of the form www.companyname.com, so that each name appears to have its own private Web server. HomeDoor only works with TCP port 80, the standard HTTP port, but OpenDoor says the company eventually hopes to support additional ports for servers such as FTP and Telnet.

Maxum Development's NetCloak and NetForms ($195 each, **http://www.maxum.com**). This duo extends your Web server by adding new HTML commands and letting users add content to your server. NetCloak adds some 30 proprietary commands that execute just before the server transmits an HTML document to a requesting user.

The commands let you include dynamic real-time information in a Web page and let you perform conditional tests to generate custom Web pages.

Users enter data into forms you've created, and NetForms generates HTML pages from that data and stores those pages on your server, letting you archive threaded discussions or construct other interactive services as your needs evolve.

EveryWare's ButlerLink/Web (free, **http://www.everyware. com**). This freeware tool lets you create forms to query, update, insert, and delete records in a Butler SQL (structured query language) database. (It requires Butler SQL, also from EveryWare, at £325.)

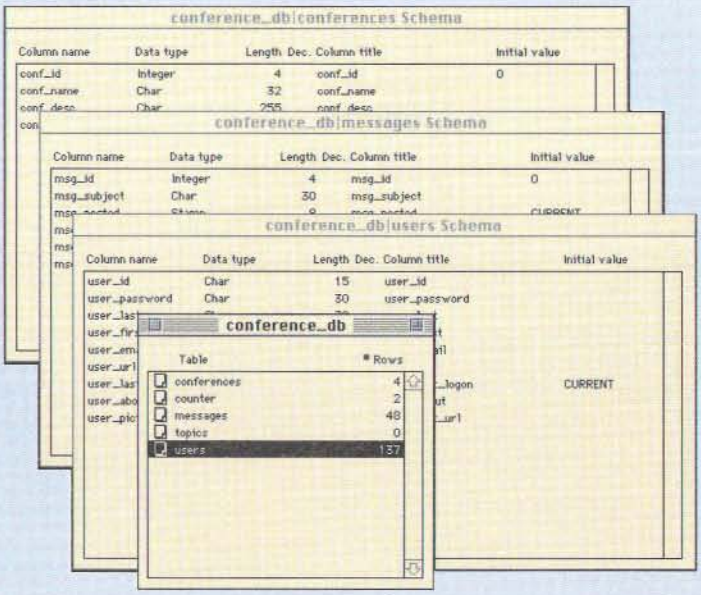
Russell Owen's FileMaker Pro CGI (free, **http://rowen.astro.washington.edu**). This freeware tool offers forms-driven access to Claris's FileMaker Pro flat-file database.

All of the database-configuration information remains stored in your HTML document; there is no need for ancillary files.

Foresight Technology's NetLink/4D (£166, **http://www.fsti.com/weblink.html**). This external package for 4th Dimension accesses 4D databases via CGI.

University of Minnesota's Web66 (free, **http://Web66.coled.umn.edu/**). This useful accessory is a World Wide Web cookbook full of useful techniques and downloadable utilities for Mac Web servers. You'll find step-by-step instructions for everything from soup to, um – well, you get the picture.

Jon Wiederspan's Mac WWW Development Guide (free, **http://www.comvista.com/net/www/WWWDirectory.html**). Another Web resource, this exhaustive collection of Macintosh Web pointers gives you one-stop shopping for everything Mac about the Web.



Full-Fledged Database **Everyware Development's Butler SQL database server is a standards-compliant relational database with CGI tools for manipulating database records using structured query language from within your HTML documents.**

click configuration; and a knowledgeable telephone technical-support staff. Hence WebStar deserves *Macworld*'s Editors' Choice designation.

The last word

So is the Macintosh ready for prime time in the Web-server market? Most certainly. A Macintosh-based Web server is economical, easy to set up, and relatively simple to maintain. The Mac's native AppleScript and Apple events enable you to build powerful back-end processors for delivering complex content.

Is the Mac the ultimate Web-server platform? No. The lack of preemptive task switching and limitations in TCP/IP implementation put the Mac well below the performance level of Unix-based Web servers for now (though once it fully supports Open Transport, the Mac should finally leave performance inferiority behind). But if your site doesn't need to serve dozens of users simultaneously, the Mac's attractive price and ease of use make it a great choice. MW

• Apple's new Internet servers
See News, this issue

Mel Beckman (mel@becknet.com), a consulting network engineer, sets up new Internet service providers. He regularly evaluates Web servers for Mac, PC, and Unix systems.

MW LAB **Editors' Choice** WEB SERVER SOFTWARE

Speed is a key Web-server attribute, but it's useless without a broad range of features and ironclad reliability.

✪✪✪✪/7.3 **WebStar** It isn't the fastest Mac Web server we tested, but it has important features other servers lack: suffix mapping, file aliases, Apple events, remote management, multiple-server support, and threaded execution. WebStar's good performance, features, and reliability offer a winning combination. **Company:** Quarterdeck/StarNine. **Distributor:** Frontline, 01256 841 841 **List price:** £595.

Serving up Web servers

	Freeware	InterCon	Quarterdeck/StarNine	Quarterdeck/StarNine	Tenon
Product	httpd4Mac	InterServer Publisher	MacHTTP	WebStar	MachTen
Star rating A	✪/1.4	✪✪✪/5.2	✪✪/4.0	✪✪✪✪/7.3	✪✪✪/6.3
List price	free	£325	$95 (shareware)	£595	£495
Distributor	B	Principal 01706 832 000	Direct 001 510 649 4949	Frontline 01256 841 841	Shute 01223 514 531 Full Moon 01628 660 242
Common Gateway Interface	No	Yes	Yes	Yes	Yes C
AppleScript support	No	Yes	Yes	Yes	No
Apple events support	No	Yes	Yes	Yes	No
Open Transport capable	No	No	No	No	No C
Configurable MIME types	Yes	No	Yes	Yes	Yes
URL suffix mapping	No	No	No	Yes	Yes
Access Security					
Realm control	No	Yes	Yes	Yes	Yes
Allow/deny control	No	Yes	Yes	Yes	Yes
Multiple Domains					
Multiple servers	No	No	Yes	Yes	Yes
Multihoming	No	No	No	No	Yes
Performance Controls					
Threaded execution	No	No	No	Yes	Yes
CPU usage	No	No	Yes	Yes	Yes
Other Protocols Served					
FTP	No	Yes	No	No	Yes
Gopher	No	Yes	No	No	Yes
Image maps	No	Yes	Yes	Yes	Yes
File aliases	No	Yes	Yes	Yes	Yes
Folder indexing	No	Yes	No	No	Yes
Access logging	Yes	Yes	Yes	Yes	Yes
Remote administration	No	No	No	Yes	Yes
Comments	Minimalist freeware: feature poor and unreliable	Fast and functional, but missing key features and documentation.	Capable shareware, but unreliable under heavy load.	Polished, capable, reliable, easy to use, and reasonably fast.	Fast, but hard to use, requiring Unix administration skills.

A Based on features, implementation, innovation, performance, reliability, ease of use, and value. (See Mac Update section for full explanation.)
B Download from http://sodium.ch.man.ac.uk/pages/httpd4mac/home.html. C Can execute C and PERL programs or shell scripts within its own Unix environment.
D Includes TCP/IP support that requires MachTen to be running before any other Mac TCP/IP application. Open Transport can be run simultaneously on a separate network card.

Timbuktu Pro 2.0

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Tools' gold

by Robert Eckhardt

Have you ever found yourself with five Phillips screwdrivers when what you really needed was a flathead? The old cliché applies with tools: a miss is as good as a mile. And that goes for utility software too. Without the right utility, what should be an easy job can be an onerous – even impossible – task. Having the correct utility is like hitting the nail on the head after years of bent brads and bruised thumbs. The right utilities allow you to work faster, work more efficiently, and save money in the process.

To help you find the best power tools for your work – whether it's business, publishing, graphics, online access, or all of the above – we tested scores of utilities, all highly recommended by *Macworld* experts, to come up with those most likely to ease your workload. They range widely in price, but most are inexpensive (usually less than £100). Most occupy little space on your hard drive and don't require much in terms of RAM. Most are straightforward and easy to use – installation is the often last time you'll deal continues page 126

GERARD LOCKE

with them. Virtually all are available in stores, catalogues, or online shareware libraries. What *Macworld* like best about all of them is that they provide power and convenience well in excess of their modest proportions.

Working on a Mac without a well-chosen set of utilities is a little like using a power tool with the electricity turned off – you probably can do it, but why would you want to try? Tell your bean-counters that investing in the right utilities can raise productivity and reduce costs – and use these tools to prove it to them.

Universal Utilities

Part I: the way you work Some utilities make sense to have, no matter how you use your Mac. Some of them change the way your Mac works – and the way you work with your Mac.

Conflict Catcher System 7.5 has been known to install over 100 start-up files (extensions and control panels) in a standard installation. Add a few favourite third-party start-up files and hold onto your hat. Crashes, erratic behaviour, and other abnormalities are a distinct (and distinctly unpleasant) possibility – unless you use Conflict Catcher 3, the answer to an extension addict's (certainly this addict's) prayers. Conflict Catcher allows you to turn start-up files on and off, change the order in which they load, view information about each one, and organize your start-up files into sets for different tasks. At start-up, Conflict Catcher tells you which set is loading, identifies your start-up icons by name, and allows you to interrupt the start-up process if you want to install a different set. It also automatically turns off files that bomb during start-up and can help you determine which stealth start-up file is causing a blip on your radar screen.

Now Utilities Two Now Utilities modules are another addiction of mine. The NowMenus module creates standard or pop-up menus containing recently opened or often-used documents, applications, even entire menu bars. It allows you to add or change the key commands (and see your changes displayed) in the menus of most applications, and its "sticky" menus open automatically when the pointer passes over them.

The Super Boomerang module adds lists of all recently accessed files and folders to the Apple menu and to the Open commands of your applications. Conveniently, it also automatically highlights the last opened (instead of the first listed) file or folder in the Open and Save dialogue boxes. Together these modules add a major collection of minor time-savers that really add up.

Text on the side
My favourite DragStrip 2 feature is palette titles and status bars that run vertically so you can actually read what they say

DragStrip Launchpads are very popular these days, and for my money the best choice is DragStrip 2. Among its many virtues are multiple palettes (including a current-applications palette for quick switching among programs), large and small palette icons, status bars that display either file or application names (see "Text on the side"), drag-and-drop icon installation (and editing), pop-up menus (listing folders, documents, and so on), and keyboard navigation. DragStrip's defects – icons that don't automatically shift position when you resize a palette and a notably poor manual – are relatively minor.

Part II: Under the hood

Other universally useful utilities tinker under the hood, subtly (or not so subtly) improving your Mac's performance. Most can be forgotten once you've installed them; a few require your attention from time to time.

ATM Adobe Type Manager (ATM) radically improves the rendering of PostScript fonts at all sizes, both on screen and on any printer; it's essential for just about anyone. In System 7.5, Apple's QuickDraw GX Installer automatically installs ATM. The problem is, most Mac owners don't need memory-hungry QuickDraw GX. If you don't want to jump through hoops to install ATM without QuickDraw GX, most Adobe products include (and usually automatically install) ATM. You can also order

continues page 130

Universally useful

Part I: the way you work

/9.4 Conflict Catcher 3.0.2 Pretty near perfect, and pretty near essential, start-up file manager. **Company:** Casady & Greene; **Distributor:** Softline (0181 401 1234). **List price:** £69

/7.6 Now Utilities 5.0.2 Diverse utilities collection with especially useful custom menu module. **Company:** Now Software; **Distributor:** Ingram Micro (01908 260 160). **List price:** £89

/8.1 DragStrip 2.0 Feature-packed file launcher well worth the premium price. **Company:** Natural Intelligence (001 617 876 7680). **List price:** $59.95

Part 2: under the hood

/8.7 Adobe Type Manager 3.9 Accurately renders PostScript fonts at all sizes on screen and on any printer. **Company:** Adobe Systems (0181 606 4000). **List price:** £25

/8.9 SuperATM 3.9 ATM's PostScript font rendering plus intelligent substitution for missing fonts. **Company:** Adobe Systems (0181 606 4000). **List price:** £45

/8.6 RAM Doubler 1.6 Fools your Mac into thinking it has twice the RAM it actually does. **Company:** Connectix; **Distributor:** Computers Unlimited (0181 200 8282). **List price:** £59.95

/7.8 DiskExpress II 2.20 Intelligently defragments hard drives for optimum drive performance. **Company:** Alsoft; **Distributor:** Softline (0181 401 1234). **List price:** £69.99

/7.3 AliasZoo 2.0.5 Locates and fixes orphaned aliases and deletes unneeded ones. **Company:** Blue Globe Software. **Shareware fee:** $15.

/7.1 OptiMem RAM Charger 2.1.2 Increases memory available for applications by allocating it more efficiently. **Company:** Jump Development Group (001 412 681 2692). **List price:** $129.

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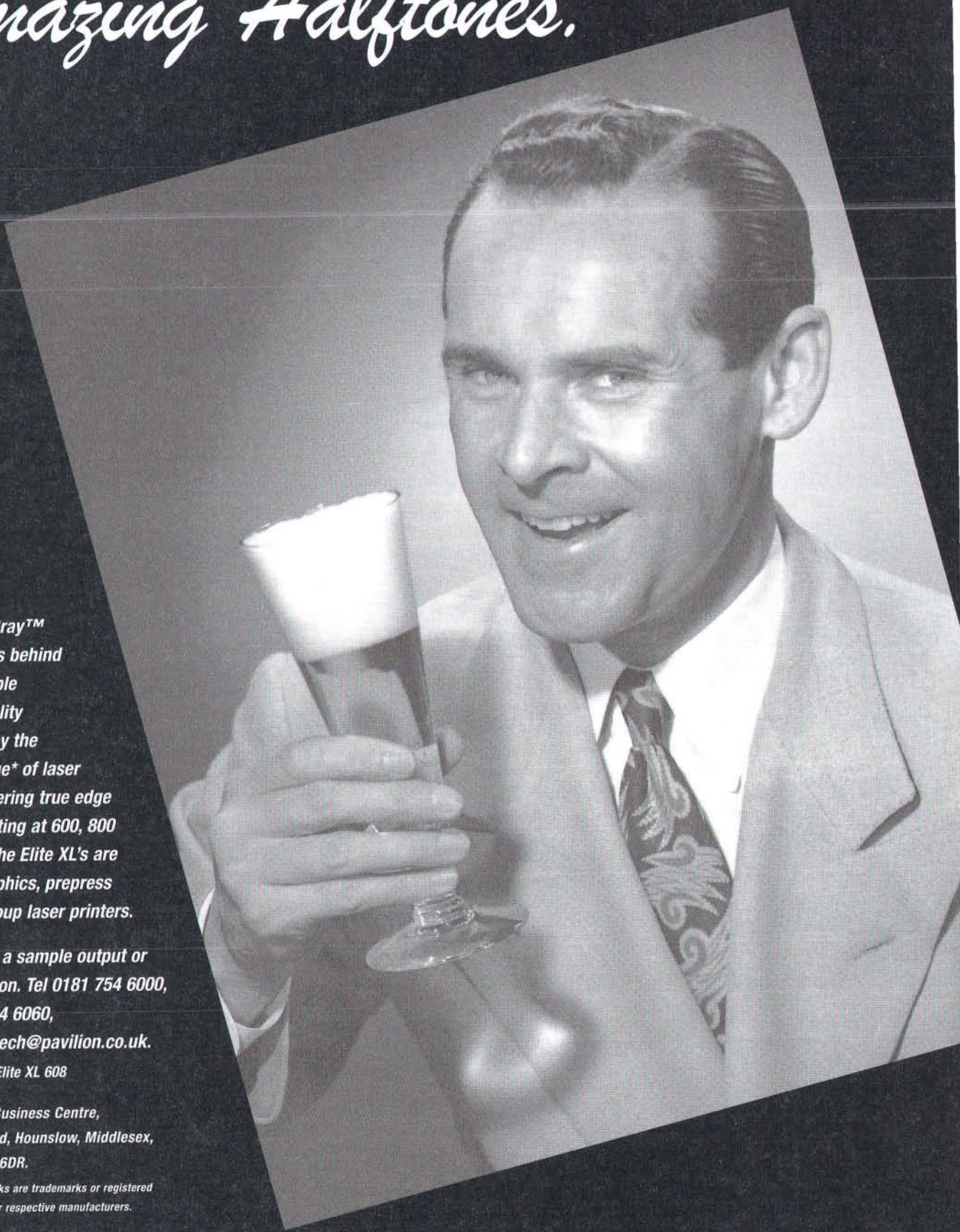

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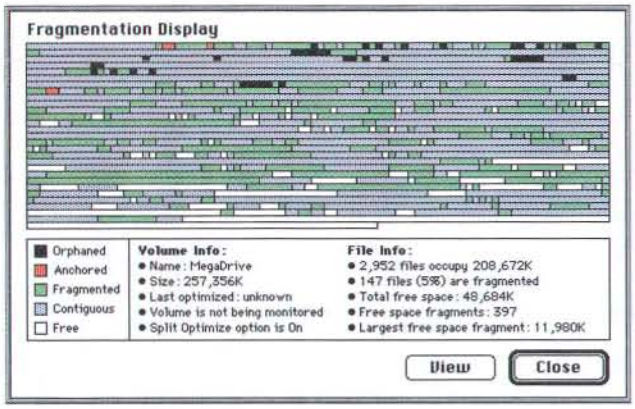


How bad is it, Doctor

DiskExpress II graphically displays how files are stored on your hard drive and how badly they're fragmented.

an inexpensive ATM-only disk direct from Adobe; shrink-wrapped copies of ATM and SuperATM – which can substitute fonts more or less intelligently in documents that use fonts you don't have – cost more but include small libraries of Adobe typefaces.

RAM Doubler Real RAM can't be beat, but when you can't afford as much as you want (and who can?), RAM Doubler is the answer. Once you've installed this utility, your Mac thinks it has twice as much RAM as it actually does. Amazingly, there's very little performance penalty for this clever trick. Although I have occasionally heard of conflicts with other programs, I have yet to encounter one myself. The one real drawback to RAM Doubler is that it helps only those who run a number of programs simultaneously; if you have one memory-hogging application, you'll have to buy the real thing.

DiskExpress II People don't talk much anymore about disk optimization (reuniting file fragments stored at random throughout a drive), but a defragmented hard drive is still a fast hard drive. I like DiskExpress II best for this task because of its graphic fragmentation display (see "How bad is it, doctor?"), the smart way it stores optimized files according to how much I use them, and the care its programmers have taken to prevent accidental data loss. Even though it runs in background mode, I wait and manually launch DiskExpress just before long lunches or during periods of writer's block.

AliasZoo Regularly cleaning out your stable of aliases will help keep your Mac running smoothly, and sweeping up abandoned and irrelevant aliases is best accomplished with AliasZoo. It verifies all your aliases to ensure they're functioning properly and identifies those that aren't. Any alias, healthy or not, in AliasZoo's complete alias tally can be renamed, reassigned to a new target file, or tossed into the Trash.

OptiMem RAM Charger Hard-core tinkerers who want to squeeze every drop of performance out of their Macs should consider OptiMem RAM Charger, an extension that radically changes the way RAM is allocated to applications. Instead of allowing a program to hoard a big chunk of RAM (the standard Mac method) regardless of what it actually needs, RAM Charger initially gives an application the smallest amount of RAM it can survive on and ladles out more RAM only if it's required. Because your applications use RAM more efficiently with RAM Charger, you can run many more applications simultaneously. (With RAM Doubler installed as well, the number of programs you can run at once will impress even the most jaded multitasker.) Sadly, some programs don't take kindly to RAM Charger's manipulations; fortunately, you can turn RAM Charger off for these applications but still reap its benefits with all your other programs. RAM Charger works adequately with its standard factory settings and can automatically improve upon some of those settings by watching the way you work, but those with no technical know-how are best off avoiding it, since careful tweaking of its rather esoteric options is the best way to optimize RAM Charger's performance.

Online Utilities

Electronic communications are getting more complex every day. A few well-chosen online tools can reduce download costs and help organize incoming mail.

Claris Emailer The blessings of e-mail can quickly become a curse if you don't have a single, well-designed mail centre. That's where Claris Emailer comes in. Emailer knows how to exchange mail with CompuServe and the Internet. With a single command (or according to a predefined schedule) it can send and receive all your mail for your accounts, automatically prioritizing it according to your preferences. It stores all your old mail in a single Filing Cabinet containing a user-defined scheme of folders. Emailer makes great use of the drag-and-drop function for almost everything. Best of all, it offers a single address book for everyone you know, so you never need to think about *how* to contact someone.

Emailer is far from perfect – it can't pick up my CE Software QuickMail messages, for example, and handles PPP Internet connections poorly – but even if you get mail on only one service, life online with Emailer is far more efficient than life without it. Sadly, at time of going to press, $89 Claris Emailer is still awaiting UK release. Watch *Macworld*'s News section for shipping and pricing information.

GrabNet If you're a serious (or merely half-serious) Web surfer, you know that the one place Netscape Navigator 1.X falls down is in managing large collections of bookmarks (or URLs, the online addresses for Web sites; version 2.0, scheduled for release about the time you read this, addresses this problem). GrabNet fills this gap admirably with its hierarchical list of bookmarks, either working on its own or installing a GrabNet menu in Navigator (see "Caught in the web"). In Navigator, send the bookmark for the current Web page to GrabNet with a GrabNet menu command. Send a Web graphic, a portion of a Web page, a piece of Web text (all with bookmarks attached), or an embedded reference to another Web site to GrabNet with little more than a simple point and click. In GrabNet, view the graphics or text attached to any bookmark in the GrabNet list, or double-click on a bookmark to switch to Navigator and go directly to that Web site. GrabNet makes Web navigation with Navigator significantly easier. My only gripe is the lack of a manual; learning GrabNet through its Apple Guide is painfully tedious.

StuffIt Deluxe In the Mac online

Online honours

✪✪✪✪/6.7 **GrabNet 2.0** Bookmark manager for Netscape Navigator grabs Web graphics and text. **Company:** ForeFront (001 713 961 1101). **List price** $19.95

✪✪✪✪/7.9 **Stuffit Deluxe 3.5** Mac, PC, and Internet file compression and decompression **Company:** Aladdin Software; **Distributor:** Principal (01706 832 000). **List price** £80

Business basics

/7.5 TypeIt4Me 4.5.1 Automatically expands user-defined abbreviations in any application **Company:** Riccardo Ettore. **Shareware fee:** $30

/7.6 MacLinkPlus/Translators Pro 8.06ia Excellent PC-to-Mac (or reverse) conversions for word processor, spreadsheet, or database documents. **Company:** DataViz **Distributor:** Principal (01706 832 000). **List price:** £129

/8.3 PopupFolder 2.0.1 Improves Finder navigation via ubiquitous pop-up menus. **Company:** Inline Software **Distributor:** Softline (0181 401 1234). **List price:** £39

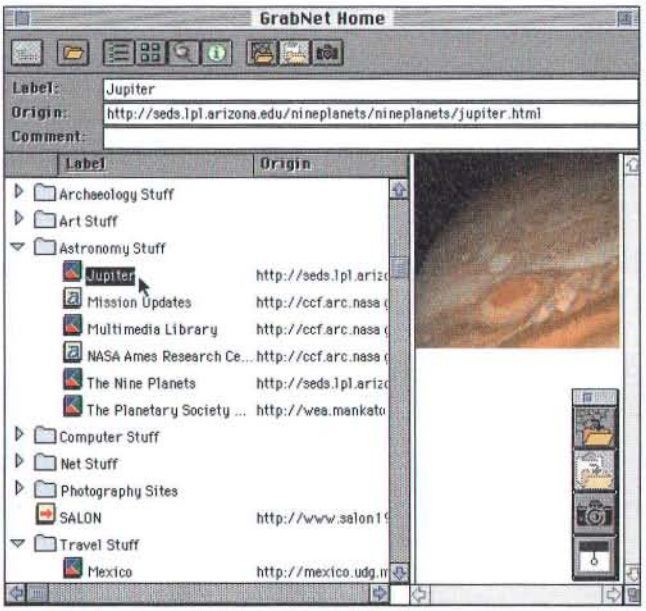
/7.3 Calc +2.0 Simple calculator with a resizable, scrollable, editable, printable tape. **Company:** Abbott Systems **Distributor:** AM Micro (01392 426 473).. **List price:** £39

universe, files are "stuffed" (compressed) for faster transfer. Although it's possible to rely solely on self-extracting files and shareware unstuffers, serious telecommunicators should treat themselves to a copy of StuffIt Deluxe. In addition to near-effortless stuffing, unstuffing, and archive management, StuffIt Deluxe handles a broad spectrum of other Macintosh (BinHex and MacBinary, for example), PC (Arc, Zip), and Internet (uuencoding) transfer formats. If your target audience includes PC owners, stuff your files as usual and direct PC users to StuffIt Expander for Windows (freeware) for unstuffing. Or, since virtually any PC decompression utility can unzip a compressed file, you can create zipped versions of your files (sadly, StuffIt can only unzip files) with easy-to-use ZipIt (Thomas Brown, $15).

Business Utilities

In business, we all deal with machines other than our Macs, from phones to other people's PCs. Here are some high-efficiency utilities for file conversion, and other business necessities.

TypeIt4Me If your macro needs are modest, consider TypeIt4Me. Easy to use and reliable, TypeIt4Me's forte is automatic text expansion.



Caught in the Web

With GrabNet's Finder-like customizable hierarchy of folders, you can easily organize hundreds of bookmarks. You can also view graphics or text attached to the selected bookmarks.

Once you teach it your shorthand, TypeIt4Me automatically replaces text as you type. You can also create abbreviations for the current date and time and teach TypeIt4Me to correct your most common typos. Don't tell Microsoft, but TypeIt4Me is an inexpensive way to give Word 5.1 a good facsimile of Word 6's AutoCorrect function.

MacLinkPlus/Translators Pro If you regularly exchange word processor, spreadsheet, or database documents with PC users, there's no better way to convert those files than with MacLinkPlus/Translators Pro. Translators Pro makes opening a PC file as easy as double-clicking on it, opening it with your application's Open command, or dragging and dropping it (or a batch of files) on Translators Pro's Document Converter applet. Translators Pro's word processor conversions retain embedded graphics and original formatting to a remarkable degree, and its new HTML translator gives you Web pages much as they appear in Netscape Navigator or Spry Mosaic (with embedded Web addresses conveniently appended as footnotes).

Translators Pro includes Apple's Macintosh PC Exchange, which allows you to use DOS disks in your Mac's floppy disk drive. (Software Architects' DOS Mounter 95 does the same for any removable DOS media, including SyQuest cartridges and rewritable optical disks.) Also included is DataViz FileView, which (like Abbott Systems' very skillful CanOpener) can extract the text from virtually any Mac, DOS, or Windows document that stumps the translators.

PopupFolder Even with neatly nested folders, digging into or out of them to file or retrieve documents is still a troublesome task. You can greatly streamline folder navigation with PopupFolder, which adds hierarchical menus both to window title bars and to folder and disk icons (see "Drive-Thru Menus"). You can traverse these pop-up menus simply to get to a file, or you can drag a file to move it or copy it, drop it on an application, or install its alias. For instant recall, PopupFolder also allows you to assign keyboard shortcuts – usable in the Finder and Open and Save dialogue boxes – to files, folders, and applications.

Calc+ If you're looking for an audit trail, Calc+ is the way to go. This calculator has a resizable, scrolling "tape" with colour-coded totals and a one-number memory (hey, that's one more than Apple's Calculator). You can resize the scrolling tape, select the appropriate font and size, insert line-by-line comments, edit previous entries (Calc+ automatically recalculates any affected sums), and save or print your tape. Desktop publishers, take note: Calc+ also does instant conversions between inches, centimetres, picas, and ciceros.

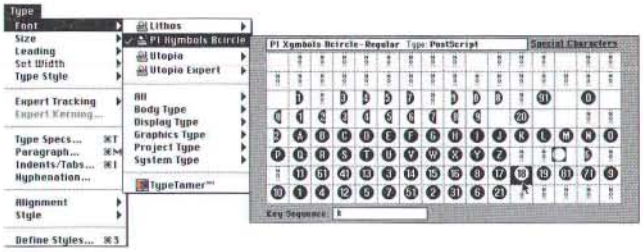
continues page 132

Graphics gold

/7.6 DeBabelizer 1.6.5 Endlessly talented and exasperating batch processor for bitmapped graphics **Company:** Equilibrium Technologies **Distributor:** Computers Unlimited (0181 200 8282). **List price:** £325

/7.2 Transverter Pro 3.0.1 Batch-process PostScript files or preview them to catch mistakes before printing. **Company:** TechPool Software **Distributor:** Business Presentations (01462 743 090). **List price:** £387

/7.3 AdobeFetch 1.2 Catalogue graphics, text, and more for easy organization and retrieval. **Company:** Adobe Systems (0181 606 4000). **List price:** £75



Just my type

For easy access, TypeTamer puts a separate list of the fonts in the current document near the top of the Font menu.

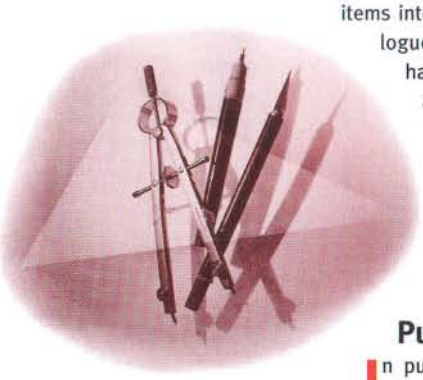
Graphics utilities

If it seems like your graphics files are managing you, rather than the other way around, here are some great preview/conversion tools.

DeBabelizer DeBabelizer is a godsend for anyone who needs to work with lots of scans, downloaded images, and the like – but it is devilishly difficult for most mortals to use. DeBabelizer can convert a file to one of 70 graphics formats and can deal with hundreds of files at a time. In the process, it can scale or crop graphics, reduce their colour depth, adjust the colour palette, and more, using a variety of options. Although it has a clunky interface and poor manual, DeBabelizer does provide excellent colour controls, it manipulates QuickTime movies, and now it supports formats used by Web-page designers.

Transverter Pro If Béziers are your métier (or your bête noire), you need Transverter Pro. Its major skill is converting raw PostScript (such as a printed-to-disk page-layout file), EPS, or Acrobat (PDF) files – or a piece of a file, or a batch of files – into TIFF, PICT, JPEG, EPS, or Adobe Illustrator format. It can also add screen previews to EPS files that lack them, convert multipage PostScript files into single-page placeable files, and preview PostScript files (if you're conversant in PostScript) to help you eliminate errors before they cost money. Conversion options are limited (compared with DeBabelizer's), manuals need major work, and the conversions aren't always perfect, but in comparison with Photoshop's standard EPS-to-bitmap conversions, Transverter Pro easily came out on top.

Adobe Fetch Theoretically, I could organize all my multimedia files in one huge hierarchy of nested folders (if my hard drive were big enough) and use Photoshop's tiny thumbnail icons to distinguish different images. Practically speaking, I prefer to keep my files where they are, have Adobe Fetch list them all in a master catalogue, and maintain my sanity as well as my eyesight. Fetch easily catalogues files (no matter where they're stored) and adds file and folder names to each item's keyword list (you can assign additional keywords as well). I can view a catalogue as big-enough-to-actually-see preview images (see "Order out of chaos") or as faster-scrolling Finder-like lists. Unfortunately, Fetch doesn't allow me to drag and drop items into or between open catalogues. But because it can hand over the reference to a selected file (rather than the file itself), Fetch is an excellent companion to the big DTP two: Adobe PageMaker and QuarkXPress.



Publish utilities

In publishing, managing lots of fonts and tons of typefaces is never easy. Take a look at these three timesaving organizers.

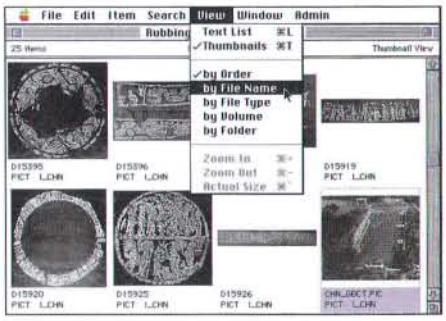
TypeTamer OK, here's the shameless truth: TypeTamer is the best font-menu manager I've ever seen. Somehow, it does everything and does it just right (see "Just my type"). It automatically groups fonts by family, allows you to organize families into sets (all serif fonts together, for instance), and lets you scroll to a font simply by typing the first few letters of its name.

Icons beside each font name indicate whether it's PostScript or TrueType; point to the icon to display either sample text or a complete character-set table from which you can locate any character.

FontMonger I'm not a big fan of messing around with typefaces experts have spent months perfecting, so some things FontMonger can do – converting TrueType fonts to PostScript (or vice versa) and tweaking character outlines – make me nervous.

But for font-technology illiterates like me, FontMonger is an able typographic assistant. Use it to move a much-used character to a more convenient key combination, for example, or to create typeset-quality fractions (such as ½ instead of 1/2). More suspect but sometimes unavoidable alterations, such as generating an oblique or small-caps font for a typeface that lacks one, are also easy.

theTypeBook Making a typeface reference book is a lot easier with the TypeBook. Its one-typeface-to-a-page templates contain samples of character forms and alternate characters, examples of different point sizes, body copy at different leadings, and tables of characters per pica and capital-letter height. Other templates include full-page, large-point-size displays of a font's complete character set, keyboard layouts (great for pi or symbol fonts), and catalogues that squeeze as many as 90 typeface samples on a page.



Order out of Chaos

Although you can sort Fetch catalogue items by name, file type, date added and so on, you can't drag them into an arbitrary order (such as most to least often used)

You can customize the elements of any page, insert comments alongside any element, and add your business name and logo to the bottom of each page. theTypeBook's finished product is not only handy to have around but also looks quite professional to your clients. MW

I couldn't include all my favourite Macintosh utilities in this feature, but there are some you really should be aware of.

Turn the page for my 'honourable mentions'...

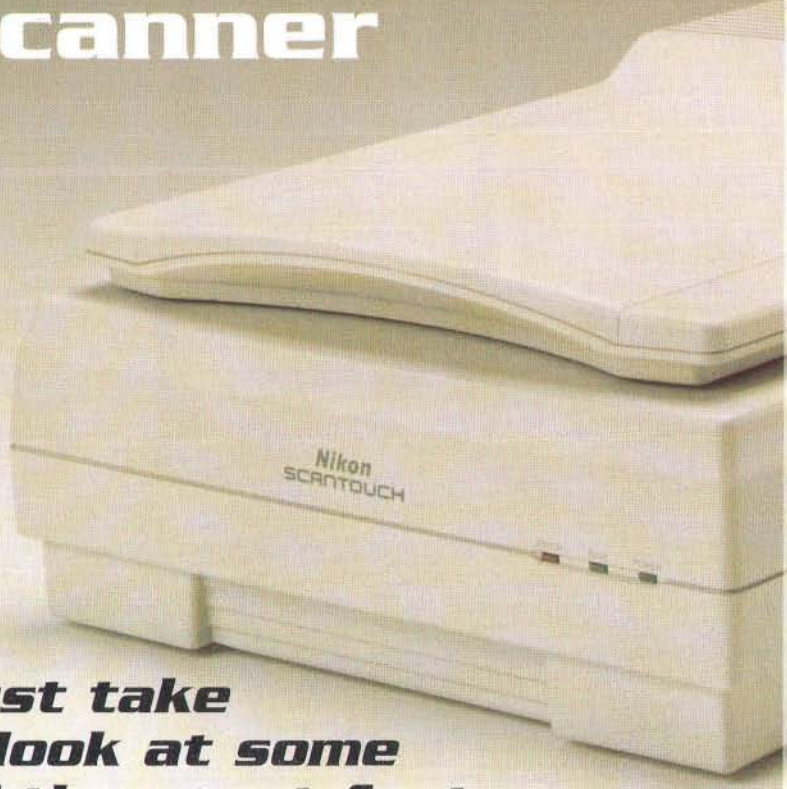
Publishing partners

/8.5 TypeTamer 1.1.1 Every conceivable Font menu improvement in one well-designed program. **Company:** Impossible Software (001 714 470 4800) **List price:** $59.95

/7.2 FontMonger 1.5.7 Easy font modifications, from redrawing characters to converting font formats. No longer sold as a standalone package but bundled with Fontographer. **Company:** Macromedia **Distributor:** Softline (0181 401 1234) **List price:** Fontographer £399

/7.4 theTypeBook 4.02b Creates font reference books from ready-to-print specimen pages. **Company:** Rascal Software **Distributor:** MacWarehouse (0800 181 332). **List price:** £29.95

Nikon 1200dpi, 30 second ScanTouch Scanner



The affordable ScanTouch scanner from Nikon - 1200dpi quality scanning with full 24-bit colour and multi-platform compatibility!

The Nikon ScanTouch is one of the most advanced scanners in the world, with fast 1200 x 1200dpi resolution, and a multitude of image-enhancing features that are ideal for layouts and publications using both text and images. As well as 10-bit internal processing for accurate reproduction, 3 scanning modes and a superfast colour preview, the ScanTouch is very easy to use, available at the best possible price and distributed by DirekTek Distribution.

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And honourable mention goes to...

Whenever I write one of these cast-of-thousands articles, there are always a number of great performances that end up, for one reason or another, on the cutting-room floor. Here are a few of my favourites.

Suitcase

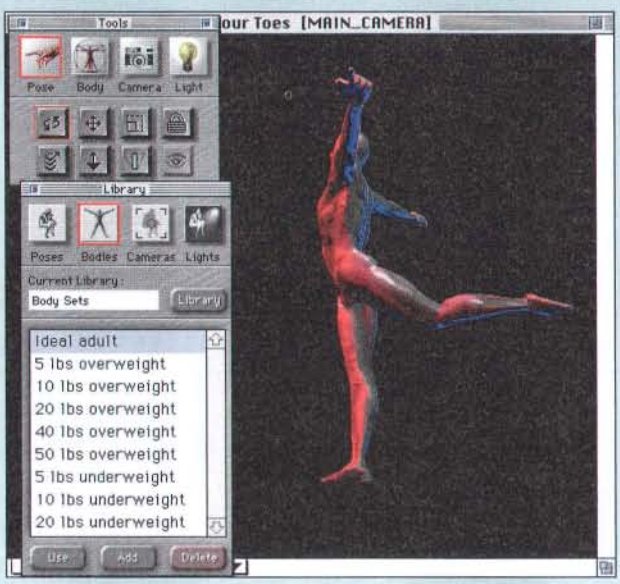
Although it's the best font manager available, Suitcase 2 (Symantec; Principal 01706 832 000) is so old that my manual is yellow with age. A completely redesigned and rewritten Suitcase 3 should be available by the time you read this; if you have a large font collection, be sure to check out this utility.

Tracer

If you need to convert bitmaps to Béziers, Tracer (ScanVec; distributor, B&P Graphic Systems, 01932 568 555) can run circles around Adobe Streamline. Unfortunately, Tracer also has a few rough edges: it's outlandishly expensive (£495), it uses hardware-key copy protection, and it sometimes performs erratically.

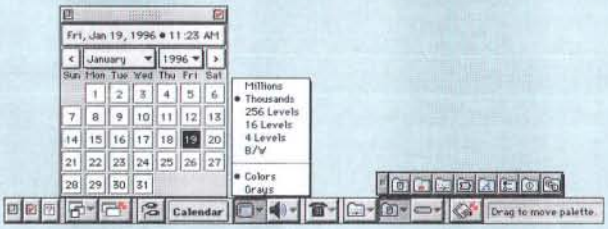
Poser

If drawing lifelike figures has you stumped, let Poser (Fractal Design; Computers Unlimited, 0181 200 8282) give you a hand. You can twist and turn its wide variety of double-jointed body types to create figures in any position (there are many predefined poses, too). Only detailed facial features and hand positions and loose-fitting clothing are shortchanged in this easy-to-use program (see "On your toes").



On your toes

You can view a Poser figure from any position, change the perspective, adjust the lighting and select from variety of surface styles and textures.



Who's got the button

In addition to launching programs and macros, the buttons on OneClick palettes can open other palettes. pop-up menus and speciality items such as monthly calendars

OneClick

A macro program in disguise, OneClick (Westcode Software, 001 619 487 9200) adds button bars to the Finder and any application (see "Who's got the button?"). Define buttons by dragging and dropping applications or folders, selecting from a library of predefined buttons, defining tasks by example, or programming buttons using AppleScript or OneClick's EasyScript.

theFONDler

Although it makes little effort to disguise the guts of font anatomy, theFONDler (Rascal Software; MacWarehouse, 0800 181 332) can locate corrupt font files and dozens of other problems that mess up print jobs, as well as eliminate font-ID conflicts once and for all.

I just wish Rascal would give it a different name. (For more details, see Macworld Reviews, in this issue.)

EMMpathy

EMMpathy (Bill Steinberg, freeware) can locate and correct corrupted data in a 500-series PowerBook battery's Energy Monitoring Module (EMM), bringing apparently dead batteries back to life.

SignatureQuote

For communications programs that lack these essential functions, SignatureQuote (Semicolon Software, shareware fee $10) can stamp your e-mail with one of two ready-made "signatures" and "quote" incoming text (using the angle brackets standard on the Internet) for a reply.

MultiClip Pro

Unlike Apple's Clipboard, MultiClip Pro (Olduvai, 001 305 670 1112) can store as many items as you care to copy into it, and paste them back in the same or reverse order – or you can select and paste a specific item. Conveniently, you can easily operate MultiClip from the keyboard; unfortunately, the program eats up a whole megabyte of memory.

Speed Doubler

If you own a Power Macintosh, £45 Speed Doubler (Connectix; distributed by Computers Unlimited, 0181 200 8282) replaces Apple's often sluggish 680X0 emulator and runs non-native applications noticeably faster.

Like CopyDoubler (in Symantec's Norton DiskDoubler Pro), it also smartens up the Finder's less-than-intelligent file copying. See Reviews, *Macworld*, February 1996).

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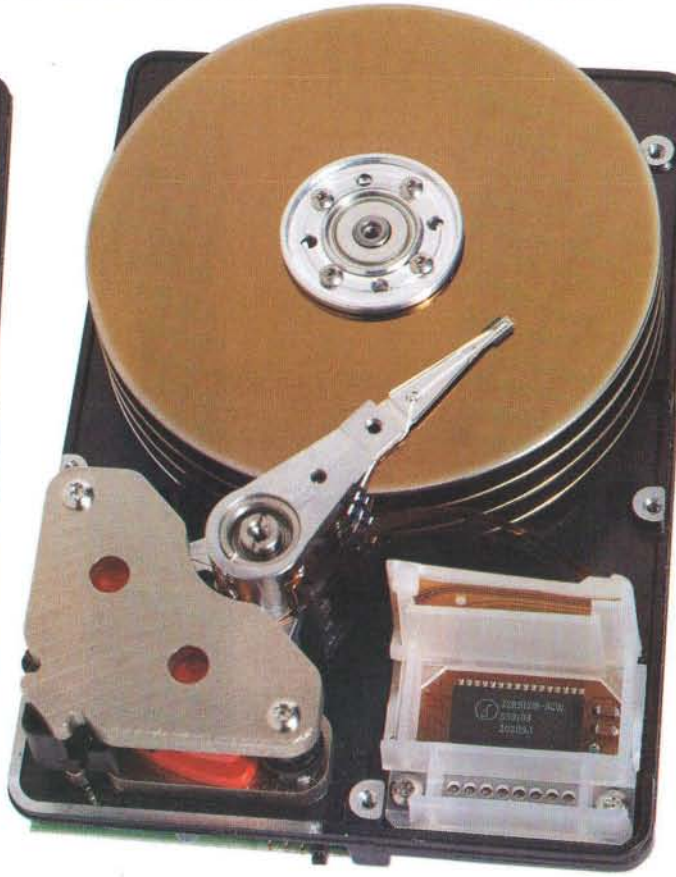

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Life

When and how to upgrade to Fast Ethernet

by Joel Snyder

A popular adage has it, "You can never be too rich or too thin." In the world of networks, you would add the corollary, "and your network can never run too fast." Macintosh users are always looking for faster networks. Unfortunately for Macintosh managers, building a fast network is no simple matter – you must understand what affects network performance before you can determine the right approach to speeding it up. If your network is running out of steam, or if, wisely, you're looking toward the future, study the situation and plan carefully before jumping on the latest technology bandwagon.

Network hardware vendors are offering hot new equipment to boost network performance. 100BaseT, 100VG-AnyLAN, ATM, and FDDI all promise speeds of 100 Mbps or higher – ten times the potential speed of today's ethernet networks – but bandwidth is not usually the limiting factor on network performance. The culprits, in many cases, are overburdened servers, slow clients, inadequate segmentation, or poor network software—or some combination of those.

As a result, money and effort spent on tuning your 10-Mbps LAN may offer greater dividends than faster hardware. Before installing new high-speed LAN hardware, tune up all other areas of your network and be certain that the speed of the wire really is the limiting factor.

This doesn't mean that no networks can benefit from the new high-speed network technologies. Newer workstations, such as the PowerPC-based Macs, and some multimedia applications can stretch the limits of 10-Mbps ethernet. Network managers who are planning for growth should also consider 100-Mbps – or faster – network hardware. As costs drop, it makes sense to build a high-speed backbone, even if your network doesn't need the speed right now.

What makes fast nets fast?

High-speed networks running at 100 Mbps or faster have three advantages over standard ethernet. First, and most obvious, the speed of the network itself is higher. If your workstations can handle more data than a 10-Mbps ethernet connection can carry, as most newer Macs can, increased bandwidth will eliminate the network bottleneck.

Second, because a 100-Mbps network's signaling speed is higher, it takes less time to transmit and receive a packet. Some network applications, such as AppleShare, do a lot of ping-ponging between client and server – that is, sending status information about their readiness to send or receive packets and so on. By speeding up the ping-pong information, a faster network will get snappier response times from the same slow network apps.

Third, a 100-Mbps network can support more nodes without slowing down, because each node requires a smaller percentage of the network's bandwidth. Although you would be better off using bridges, routers, or switches to segment a congested network, some networks are just hard to segment. For example, a large campus network with clients accessing servers in a centralized facility is difficult to break into pieces that make sense. A 100-Mbps LAN can take the load off such a network.

Network tuning: three questions

Before you run out and swap all your 10BaseT hardware for 100-Mbps equipment, ask yourself three questions. The answers, combined with the performance data you should be collecting (see the sidebar "So how fast is your network, anyway?"), can help you determine whether you will derive maximum benefit by upgrading to 100 Mbps.

Is software the problem? Software can be a major drag on networks, particularly on Macintosh ones. AppleTalk itself, the widely used Apple-supplied network protocol, is designed to run over slow networks like LocalTalk and presents a huge barrier to network performance. Application software not designed for network use may treat

continues page 140

in the fast lane

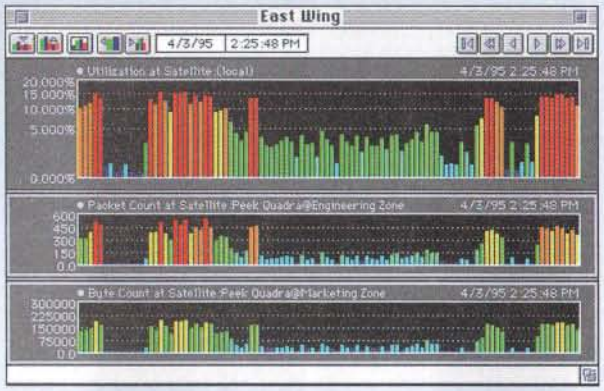
KEVIN IRBY

So how fast is your network anyway?

A good network manager should be obsessed with performance data. Monitoring where your network is being used, by whom, and for what is the only way to determine how to optimize the network or to decide when to make the jump to a faster net.

In larger, mixed-platform networks, you can combine RMON (remote monitoring) hardware, from various vendors, with SNMP (Simple Network Management Protocol) management stations to capture traffic statistics. The RMON/SNMP model uses remote data-collection points (RMON agents) to gather information on network traffic and send it back to a central location (the SNMP workstation) for monitoring and long-term analysis.

Unfortunately, there's no good SNMP management station that runs on the Mac, but Mac network managers need not fear: AG Group (Principal, 0171 731 7930) has an excellent package – two products called Skyline and Satellite (£625) – for monitoring network performance throughout an extended ethernet LAN. Skyline and Satellite use a model similar to the RMON/SNMP model: one Mac on each network segment runs Satellite and sends network-traffic information to a Mac running Skyline.



Bird's eye view

AG Group's satellite and skyline provide a continuous updated look at traffic on different segments of your network.

The performance information that Skyline and Satellite or an RMON/SNMP system provide should be part of any network analysis.

For example, if you see that most of a network's traffic is among a small number of stations, such as a workgroup and its servers and printers, you'll know that moving those stations onto their own segment, separated from the rest of the net by a switch, bridge, or router, will probably produce better results than upgrading the entire network.

Performance data is key for another reason. If you cannot generate before-and-after snapshots of your network, you won't know the impact of changes as you reconfigure the net. It may take several network designs to find the one that works best for your environment, so it's important to gather performance information methodically.

A network analyzer is also part of the network manager's upgrade kit. Macintosh-based network analyzers such as Neon Software's (Gomark, 0171 731 7930) NetMinder Ethernet (£423) and AG Group's EtherPeek (£699) work on 10-Mbps and 100-Mbps networks. No network manager should be without a handy protocol analyzer.

remote disks as if they were attached locally, reading and writing very inefficiently. Even network-aware software, such as e-mail, often behaves poorly.

Old network software can also cause slowdowns. For example, although Power Mac systems have a native Power Mac communications stack, the AppleShare client software is 68oXo code, and the server has only recently become available as a native Power Macintosh application.

Until all components of the AppleShare network are available in native code, AppleShare users can expect to lose 60 to 80 per cent against applications optimized for Power Macs on high-speed LANs running Open Transport.

(Open Transport is the unified communications architecture with which Apple will replace MacTCP and the AppleTalk stacks in future versions of the Macintosh Operating System.)

Can the server handle it? Network applications that make heavy use of file servers are often restricted by the performance, configuration, and tuning of these servers long before the network itself becomes a bottleneck. Although AppleShare handles small networks well, managers of large networks need to choose the version and the hardware platform carefully.

AppleShare version 3, the low-end AFP (AppleTalk Filing Protocol) server, isn't designed for high performance. An AppleShare 3 server should be restricted to no more than 15 users. Beyond that, you need new software and hardware. AppleShare version 4, which runs only on special high-end Macintoshes such as the Apple Workgroup Servers, offers two to three times the performance of AppleShare 3 on the same hardware.

More important, version 4 doubles to 30 the number of clients that can concurrently access the file server. Simply adding more memory to AppleShare 4 servers can help, as the software is smart enough to use all available memory for disk caching.

Recently, Apple announced the availability of AppleShare version 4.2, a native Power Mac AppleShare server. This new version can yield significant performance improvements on existing hardware without your having to change any network hardware. (AppleShare 4.2 replaces AppleShare Pro, which ran on Apple's Unix implementation, A/UX.)

Unfortunately, it's not as simple as buying the fastest Mac and putting the newest software on it. Apple's new communications software architecture, Open Transport, is not yet optimized for all platforms. That means that AppleShare 4.2 runs faster on NuBus-based Macs than on the newer PCI-based systems, but an AppleShare client on a PCI Mac runs faster than it would on a NuBus Mac.

Not to worry: Apple assures us that everything will make sense and all relevant software – including the critical component, Open Transport 1.1 – will be in place before this summer. Until then, be careful about your upgrade path; it may be slower than the old way of doing things.

What about the wire? Ethernet is a shared medium; all systems on the network use the same chunk of bandwidth (10 Mbps, in the case of ethernet). If a large network is broken up into smaller chunks using bridges, switches, routers, and gateways, it usually makes more bandwidth available, because stations on different segments can transmit at the same time.

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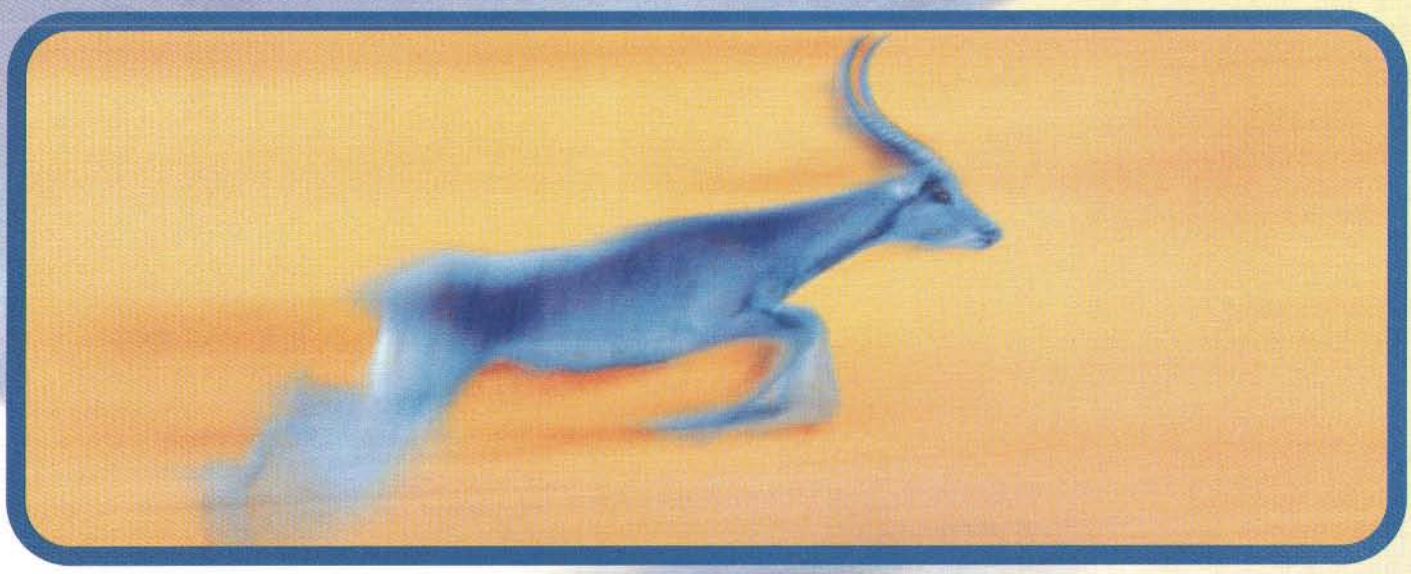

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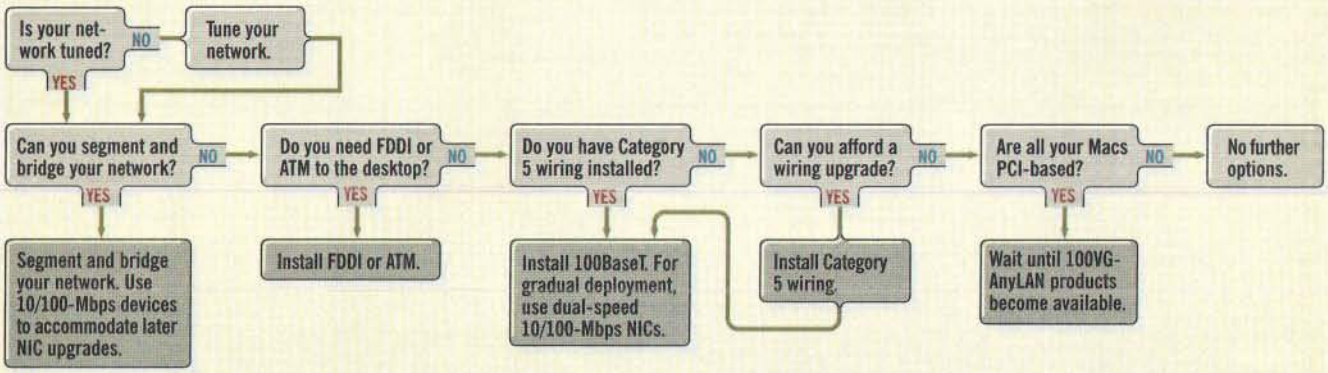
Should you deploy 100BaseT?

Just because 100BaseT is available doesn't mean you should replace your 10BaseT network with it. If rewiring with Category 5 is too costly or topology has your hands tied, consider waiting for 100VG-AnyLAN, which runs on the older wiring; while waiting, try 10-Mbps switching hubs as a stopgap. But beware: 100VG-AnyLAN vendors may leave NuBus-based Macs to languish forever. If security, reliability, and potential bandwidth beyond 100 Mbps are critical – and price is no object – investigate FDDI or ATM. This decision tree provides a quick walk through the questions to ponder before jumping to a high-speed network.



Segmenting a network is an easy way to stretch ethernet technology. Isolating workgroups that put heavy demands on the network can make a poky network suddenly quite snappy. Segmentation has other advantages: it contains the effects of certain hardware failures, such as jabbering NICs, unplugged hubs, and shorted cables; and it increases security by reducing the number of nodes that see each packet.

Segmentation equipment is relatively inexpensive and very common. There are dozens of companies anxious to sell you switches, bridges, and routers to speed up existing networks. By dropping a switching hub – from vendors such as Digital, 3Com, RedNet and Cabletron – into a network in place of a standard 10BaseT hub, you can quickly increase network performance, but the change is completely transparent to the network workstations and servers.

However, bear in mind that a 10-Mbps switching hub will solve only certain types of problems. By opening a direct link between a sending and a receiving device, a switch gives a big boost to the transfer of large files, such as the graphics that a publishing workgroup might share; for workgroups that send and receive many small files, such as a data entry group accessing a database, a switch provides little benefit, and a fatter pipe – 100BaseT – is the better choice.

If you're considering jumping to a huge 100-Mbps LAN, it makes sense to look at inexpensive changes to network topology first. Even if 100 Mbps is the long-term answer, intelligent network engineering should be part of any upgrade plans.

OK, you've analyzed, tuned, re-engineered, contemplated, and abused your network until you know that more bandwidth is the answer. The question remains: what kind of LAN will add the bandwidth you need?

The move to 100 Mbps

OK, you've analyzed, tuned, re-engineered, contemplated, and abused your network until you know that more bandwidth is the answer. The question remains: what kind of LAN will add the bandwidth you need? For the Mac, there is really only one answer: 100BaseT.

Warring factions within the IEEE have created a market break similar to the one that gave us ethernet and Token Ring in the same time frame. 100BaseT and 100VG-AnyLAN have similar product profiles: Both are simple, inexpensive plug-and-play networks designed to replace 10-Mbps ethernet. But only 100BaseT is broadly supported by Mac network vendors, with NICs for NuBus and PCI Macs, and NIC drivers for 680X0 and Power Mac systems. Farallon and Dayna have been shipping NuBus 100BaseT adaptors for several months. For PCI Macs, the choices will be wider: Apple says at least 16 companies are shipping PCI-based 100BaseT cards, most with Mac drivers.

For a building or campus backbone, there are other choices: FDDI (Fibre-Distributed Data Interface) has been reworked to run on fibre-optic or copper cabling over much larger distances. ATM (Asynchronous Transfer Mode) offers much higher speeds in a switching environment.

ATM, victim of almost as much media hype as Windows 95, promises to bring gigabit bandwidth, complete integration of LAN and WAN traffic, and multimedia. But ATM is still an unfinished standard, and at least through 1996, it will remain too costly and rarefied for most Macintosh networks.

FDDI over fibre and copper is the most mature, stable, and widely available high-speed LAN technology. However, it's also the most expensive, with NuBus FDDI NICs from SysKonnect (GBC Technology, 0001753 351 177) and PCI FDDI NICs from Rockwell (01344 422 777), and Digital (01734 868 711) costing closer to £1,000 than the £100 or £200 for 100BaseT and 100VG-AnyLAN NICs. As a campus or building backbone, FDDI brings fault tolerance and proven technology; as a desktop LAN, FDDI will step aside for the two newcomers.

100BaseT is the low-price leader of the high-speed Macintosh LAN market. In addition to the inexpensive NICs, 100BaseT has another advantage: it may work on your existing twisted-pair wiring, keeping the upgrade cost low. NICs with fancy features cost a little more, but additions such as dual-mode compatibility, which lets the NIC work on a mixed 10-Mbps and 100-Mbps network, can greatly improve a network manager's quality of life.

Hubs for 100BaseT and 100VG-AnyLAN are not priced quite as competitively – the hubs for 100VG-AnyLAN are much more complex than

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Purchasing 100BaseT products

NIcs

All Mac 100BaseT network interface cards (NICs) are dual-speed, running at 10 Mbps on a 10-Mbps hub and at 100 Mbps on a 100-Mbps hub. NuBus cards cost about £100 more than PCI cards; not all vendors supply both 680X0 and Power Mac drivers for their cards.

Company	Product	Company's estimated street price (NuBus/PCI)	Contact	Telephone	Drivers (NuBus/PCI)
Asanté	AsantéFast Adapter series	£299/£199	Principal	01706 832 000	680X0/680X0, Power Mac
Dayna	BlueStreak series	£299/£199	Computers Unlimited	0181 200 8282	680X0/680X0, Power Mac
Farallon	Fast Ether series	£394/£269	Gomark	0171 731 7930	680X0/680X0, Power Mac
Rockwell	2300	not available./£189	Gomark	0171 731 7930	not available/Power Mac

Hubs

Hubs come with anywhere from 6 to 24 ports in various combinations of 10-Mbps and 100-Mbps speeds. You can manage hubs with SNMP or proprietary tools, though only Asanté provides management tools that run on the Mac.

Company	Product	Company's estimated street price	Contact	Telephone	Ports	Stackable
3Com	LinkBuilder FMS	£2,095	3Com	01628 897 000	12	up to 8
Asanté	Plug-and-Play series	£125-£1,899	Principal	01706 832 000	6–12	no
Asanté	AsantéFast series	£716-£1,895	Principal	01706 832 000	8–12	up to 15
Cisco	FastHub series	£890-£7,145	Cisco	0181 8181 4000	4–16	no
Dayna	BlueStreak	£1,599	Computers Unlimited	0181 200 8282	12	up to 2
Farallon	Fast Starlet	£1,520	Gomark	0171 731 7930	8	no

Switching Hubs

Switching hubs present the same issues as nonswitching hubs.

Company	Product	Company's estimated street price	Contact	Telephone	Ports
3Com	LinkSwitch series	£2,885-£7,810	3Com	01628 897 000	12–24, various speeds
Alantec	PowerHub 4000 series	£6,760-£10,650	Cherinikeef	01932 814 800	12, various speeds
Asanté	ReadySwitch	£1,435	Principal	01706 832 000	4 10 Mbps, 1 100 MBps
Cabletron	ESX-1320	£9,833	Cabletron	01635 580 000	12 10 Mbps
Cisco	Catalyst series	£3,570-£81,500	Cisco	0181 8181 4000	25, various speeds
Sonic Systems	EtherSwitch	£2,664	Gomark	0171 731 7930	5 10 Mbps

Bridges

The 10/10 bridge has gone the way of the dinosaur. However, 10/100 bridges can connect two 10-Mbps segments.

Company	Product	Company's estimated street price	Contact	Telephone
Asanté	AsantéFast (10/100)	£1,295	Principal	01706 832 000
Dayna	BlueStreak (10/100, 100/100)	£999-£1,299	Computers Unlimited	0181 200 8282
Farallon	Fast Starlet (10/100)	£1,160	Gomark	0171 731 7930

How much does 100BaseT cost

The cost of upgrading to 100BaseT varies widely, depending on the existing cable and network topology and on how your organization is structured. These examples won't match your situation exactly, but they will give you an idea of how to go about pricing your own scenario. Although most UK companies already use Category 5 cabling we have included the cost of upgrading from Category 3. (See the sidebar "Purchasing 100BaseT products," for details on who sells what.)

GOAL: connect to backbone

You need to connect 50 PCI-based Power Macs to a building backbone that has been upgraded to 100BaseT; Category 3 cable is installed in the Mac workgroup's site.

First step: Install 10/100 bridge. Cost: 1 at £300.

Second step: Install dual-speed 10/100 NICs. Can deploy gradually. Cost: 50 at £220.

Third step: Rewire workgroup with Category 5 cabling. Cost: 50 at £80.

Fourth step: Install mixed 10/100 hubs. Can deploy gradually, as you deploy NICs. Cost: 5 at £1,700.

Total estimated cost: £23,800

Notes: The 10/100 bridge gives immediate access to the backbone, while you implement the transition to 100-Mbps hardware gradually. However, you'll eventually want to replace the 10/100 bridge with a 100/100 bridge.

GOAL: help staff collaborate

The legal department's 40 lawyers take turns developing strategies and critiquing one another's work. They also research legal precedents on CD-ROM servers and an internally developed client/server knowledgebase. The whole office is running 10BaseT over Category 5 wire. Half of staff uses PCI-based Macs and half uses NuBus-based Macs.

First step: Install dual-speed 10/100 NICs. Can deploy gradually. Cost: 20 at £220 (PCI) and 20 at £300 (NuBus).

Second step: Replace hubs with mixed 10/100 hubs. Can deploy gradually, as you deploy new NICs. Cost: 4 at £1,700.

Total estimated cost: £17,200.

Notes: High traffic from frequent e-mail, server accesses, and file transfers demands a lot of bandwidth.

GOAL: speed file transfers

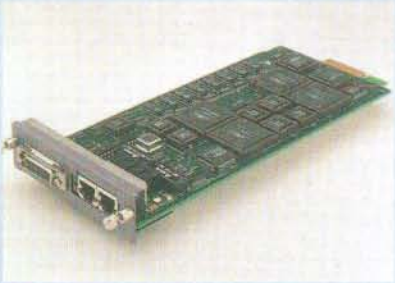
The ten members of the publications department need to transfer photos and illustrations. The company network is 10-Mbps ethernet over Category 3 cable.

First step: Install bridge to segment workgroup from main network. Cost: 1 at £750.

Second step: Install switching hub. Cost: 1 at £2,200.

Total estimated cost: £2,950

Notes: The occasional transfer of large files probably doesn't require 100BaseT; a switching hub will improve throughput for large files.



Farallon Fast Starlet bridge

Dayna BlueStreak dual-speed PCI NIC

3Com LinkBuilder stackable hub

100BaseT hubs. HP, SMC, 3Com, and Asanté are all shipping hubs that support 100-Mbps networks. Expect hubs to add another £100 to £200 per port.

Wiring and topology can be major headaches for the upgrade to 100BaseT. 100BaseT has much stricter limits on wiring topology: network segments can be no longer than 250 feet, only one-tenth the length supported by 100BaseT. This requires more careful engineering for large networks and more routers and bridges than a 10BaseT network, or for that matter, 100VG-AnyLAN network. This, in turn, means that large 100BaseT networks will be more expensive than similarly sized 100VG-AnyLAN networks. On the other hand, small networks will benefit from a lower per-port cost for 100BaseT hubs.

For small networks, there are few differences between the two standards. Mac managers will be most concerned with wiring. 100VG-AnyLAN will run over any standards-compliant 10BaseT network using four pairs of Category 3 (or higher) cable, which is what most small ethernet LANs run on now.

100BaseT generally requires Category 5 cable – for 100BaseT the cable is called 100BaseTX. (Note that there is a variety of 100BaseT, called 100BaseT4, that runs over Category 3 cable. It is not compatible with other 100BaseT equipment and is not available from most 100BaseT vendors – in fact, the 100BaseT4 standard has yet to be finalized.) So if your network uses Category 5 wire throughout, you can choose either technology. If you have Category 3 wiring, you'll have to use 100VG-AnyLAN or take on the additional cost and effort of rewiring. For networks running over coaxial cable, you can choose any technology you want because you'll have to rewire anyway. None of these new LANs work over coaxial cable.

The last word

If your first impulse is to run out and buy a high-speed LAN, don't. Network analysis, re-engineering, segmentation, and software upgrades will deliver greater benefits for most business applications. Even if you've tuned your network within an inch of its life, try to hold on for a few months until Apple brings out bug-free software for NuBus and PCI, Power Mac and 680X0 systems.

The market also needs time to shake itself out. Either 100VG-AnyLAN or 100BaseT could solve your problems, but choosing one before things have settled down could strand you with an expensive LAN and few upgrade paths. MW

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Sound advice

How to make soundtracks sparkle

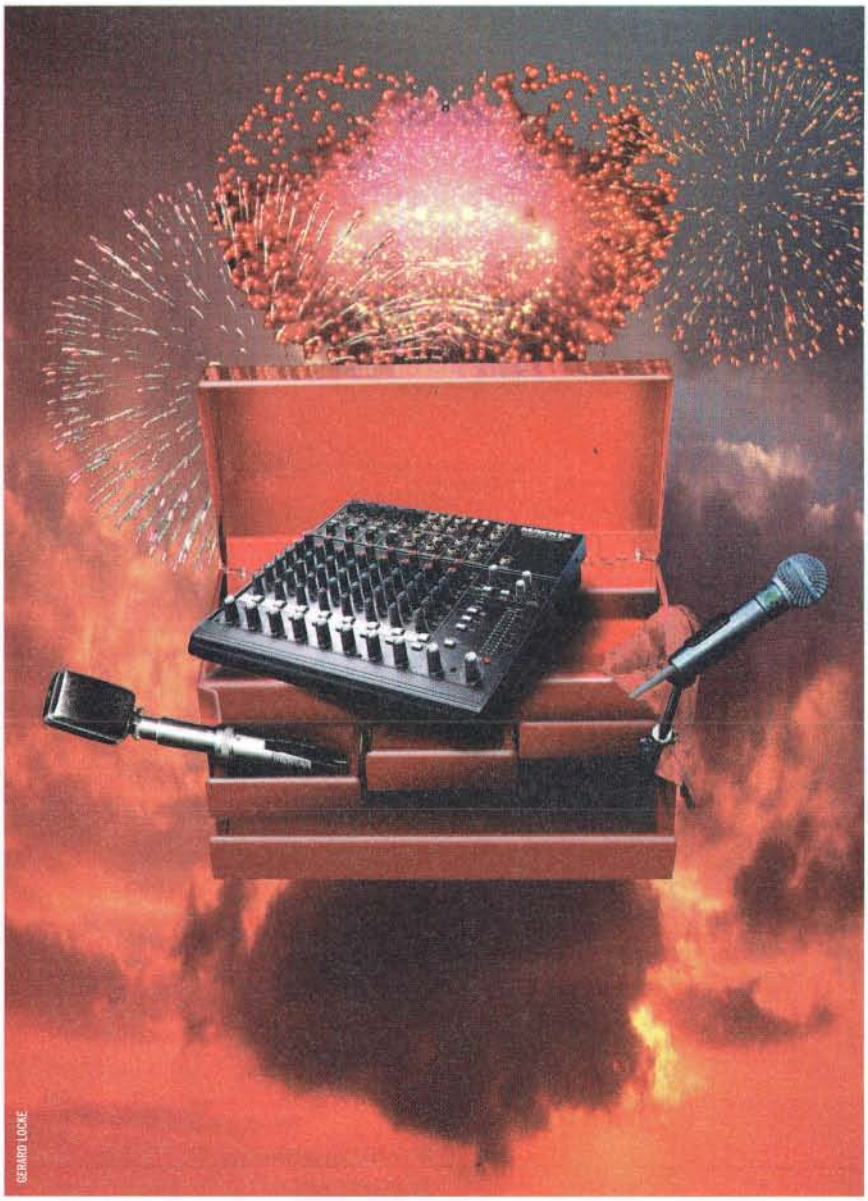
by Jim Heid

Which TV viewing experience would you prefer: a crystalline picture and staticky sound, or a snowy picture and high fidelity? Concertgoers – would you rather have an unobstructed view and muddy sound, or a tall hat in front of you and plenty of volume? As priceless as both senses are, we choose sound over sight when the sound conveys information.

So why is so much multimedia audio so lousy? One reason: QuickTime movie producers rarely have the luxury of delivering sound at CD-quality specs – a 44kHz sampling rate with 16 bits of resolution. Audio that rich has fairly high data-rate requirements, and accommodating it in a CD-ROM-based movie would reduce image quality. (See last month's Media column for an introduction to data-rate issues.) Also, some Macs and many Windows machines can't play back 44kHz, 16-bit sound. Disk space is another issue: CD-quality stereo sound uses 10MB per minute.

The World Wide Web is even more limiting. You can post 44kHz, 16-bit sounds on a Web site, but your listeners will need ISDN lines or better, lest downloads take forever. Audio-streaming technologies, like Progressive Networks' RealAudio, eliminate lengthy downloads, but compress and downsample audio to low-fidelity levels.

Let's look at what you can do during recording, editing, processing, and downsampling to minimize this quality loss.



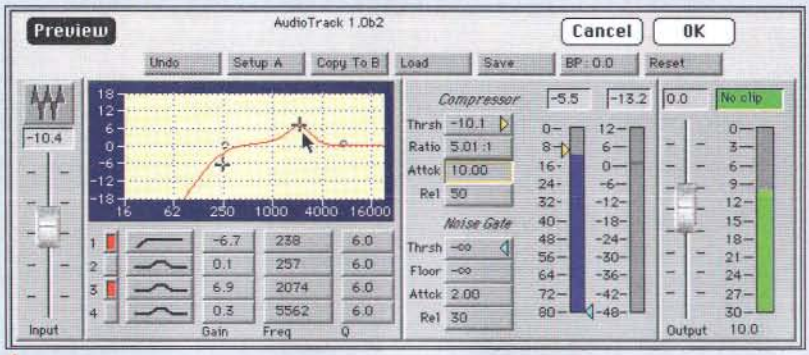
GERARD LOCKE

Record: aim for the highest quality

■ Use the best microphone you can afford. Shure Brothers, Audio Technica, and AKG have excellent offerings for around £100

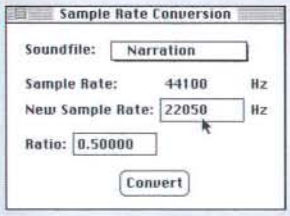
continues page 148

Steps to better soundtracks



1

To optimize 44kHz, 16-bit audio for low-bandwidth delivery, begin by applying equalization, as shown here in Waves' AudioTrack. Cutting low frequencies removes undesirable background rumble, while boosting midrange frequencies adds some punch on low-end speakers.



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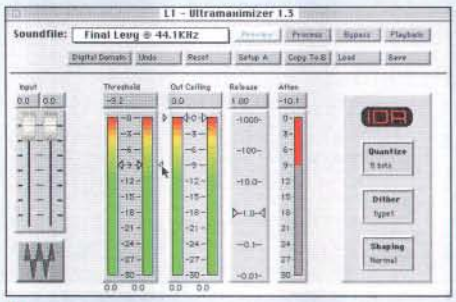

3

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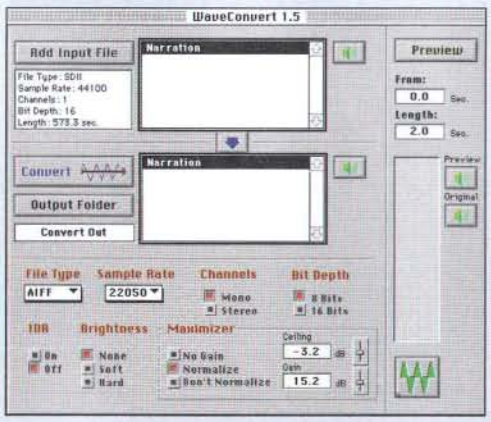
5

Waves' L1-Ultramaximizer, a plug-in for Digidesign audio hardware, boosts a soundtrack's volume, shapes its waveform for optimal quality, and optionally reduces its bit depth from 16 to 8. Always apply L1 as the final step in an audio processing job. (4) Before L1 processing. (5) After L1 processing: note the overall increase in loudness.

After equalization, downsample the 44kHz file to the desired sampling rate (see the sidebar "A field guide to formats") as shown here in Digidesign's Sound Designer II (top) and Adobe Premiere 4.2 (bottom).



6

Waves' WaveConvert utility packs downsampling, format conversion, and level optimization features into one dialogue box. It's an ideal alternative to costlier utilities such as L1.

(sold through audio and music dealers). Even a £30 public-address mike from Tandy is better than the mike that comes with your Mac. A tie-clip mike works well for voice recording.

■ For video work, use an external mike instead of the camcorder's built-in mike, which will pick up room noise.

■ Use multiple mikes for multiple subjects. When videotaping a roundtable or a music group, dedicate a mike to each participant. Use a mixer (the £389 Key Audio [01245 344 001] Microseries 1202-VLZ is hard to beat) to adjust volume levels and combine the signals into one track (for mono recording) or two (for stereo).

■ Position mikes properly. If you're recording to the Mac's hard drive (rather than to a video recorder, for example), move the mike away from the hard drive and fan, which are noisy. Record in an acoustically dry room (one without echoes). To test a room's dryness, clap once and listen; if that clap reverberates, spread carpets and hang drapes on the walls to deaden echoes.

■ Set the levels of recording software properly. Adjust the levels so that the on-screen volume meter reaches the upper end of its range during loud passages. To avoid distortion, however, make sure the meter's clipping indicator doesn't illuminate during loud peaks.

■ Record at 44kHz, 16-bit, with no compression, using a Power Mac or 680x0 AV Mac. See "On the right wavelength," December 1995, and "Multimedia secrets," August 1995, for details on audio settings and products.

Edit: refine your material

■ Delete awkward pauses and flubbed words in recorded narration or interviews. Do a cutaway to a different subject at edit points. Or do a brief cross-dissolve at the edit point; this prevents a jarring cut in which the speaker jumps from one position to another.

■ To edit using Adobe Premiere or Avid VideoShop, use a sound-editing program – these mainstream video-editing packages don't have waveform-editing features. Macromedia's SoundEdit 16 works well; Digidesign's Sound Designer II is better still but requires a dedicated NuBus card. Macromedia's (formerly OSC's) Deck II works, too, but it's better suited to multitrack recording than to waveform editing. Regardless of the audio editor, you must go through an export/import routine to edit the soundtrack (see the screen shots "Editing sound").

Process and downsample:

■ Perform edits at the 44kHz, 16-bit level. Unless the final product is for videotape or

broadcast, you will eventually downsample the audio to a lower sampling rate and perhaps to 8-bit resolution. (If you do this with a video-editing package or a program such as SoundEdit 16, you'll get soundtracks containing an annoying hiss.)

Optimizing sound quality while downsampling and converting bit depths requires you to perform a variety of steps in a specific order (see the sidebar "Steps to better soundtracks").

It also requires additional software, the best of which comes from Waves (Natural Audio, 0181 207 1717). Take note that Waves' products require a £79 hardware dongle. The L1-Ultramaximizer (£421 or £509) boosts a soundtrack's volume and shapes its waveform to provide the best sound quality with the least amount of noise – the results are amazing.

Waves utilities (£1,701) work best as plug-ins for Digidesign Audiomedia II cards or Pro Tools III systems, but they also run on Power Macs with no additional hardware. Still, they may be overkill or at least over-budget for most multimedia producers.

Great news: Waves has released two products that provide the most essential processing functions and don't require a dedicated audio card when used on a Power Mac.

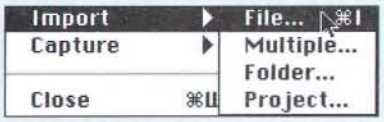
AudioTrack (£229) provides equalization, compression, noise gating, and more. It works with Digidesign hardware as well as Adobe Premiere and programs that use the Premiere plug-in format.

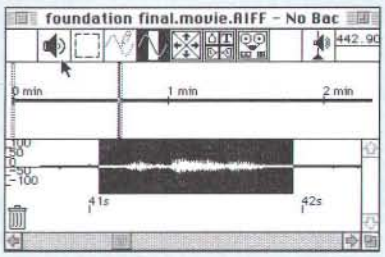
For downsampling, bit-depth conversion, and the level-maximizing marvels of Waves' L1-Ultramaximizer, get WaveConvert (£229), which also lets you batch-convert audio files. Because it is a standalone program (not a plug-in), you must endure the export/import routine described in "Editing sound" to apply WaveConvert's talents to movie soundtracks. The results are worth the effort. (Version 2.0 of Macromedia's SoundEdit 16 has improved downsampling features as well as a plug-in architecture that Waves has announced it will support.)

Editing sound

Editing a QuickTime movie soundtrack in an audio program requires an export/import routine, like the one shown here in Adobe Premiere 4.2.

Top: In the Construction window, double-click on the movie clip's soundtrack to display its waveform (behind the menu). Then, choose AIFF Audio File from the File menu's Export submenu.
Below right: Import the AIFF file into an audio program and edit.
Below: Import the file back into Premiere and synchronize it with the video track.





The last word

Indeed, all the effort you put into optimizing audio pays off. CD-ROM consumers or Web surfers may forgive slow movie frame rates or low-resolution graphics, but they'll remember the headache that bad sound gave them. You'd probably rather be remembered for something else. MW

Next month: optimizing graphics for CD-ROMs and the Web.

A field guide to formats

Here are some of the formats you'll need to know when producing audio files for CD-ROMs or Web sites.

CD-ROM

Sampling Rate For music, 22.05kHz (exactly half the CD-quality 44.1kHz rate) delivers reasonable fidelity. For voice, 11.025kHz may be acceptable.

Bit Depth You get cleaner sound with 16-bit audio but 8-bit takes only half the space. Also, you should license Apple's Sound Manager 3.1, which is Power Mac native, for your title – versions before 3.0 don't support 16-bit sound.

Compression Sound Manager 3.1 and QuickTime 2.1 (not QuickTime for Windows, yet) support the Interactive Multimedia Association's IMA 4:1 compression scheme. IMA audio sounds good, but it may play poorly on slower Macs.

The Web

File format By using QuickTime 2.1 with Apple's Movie Player 2.1 or Macromedia's SoundEdit 16 2.0, you can create the popular AU, or Sun audio, format files. Many sites encode AU audio as 8kHz, 16-bit files using the µLaw compression scheme. Movie Player 2.1 can export µLaw-format audio, although you must manually enter sampling rates lower than 11.025kHz in the Sound Export Options dialogue box's Rate text box.

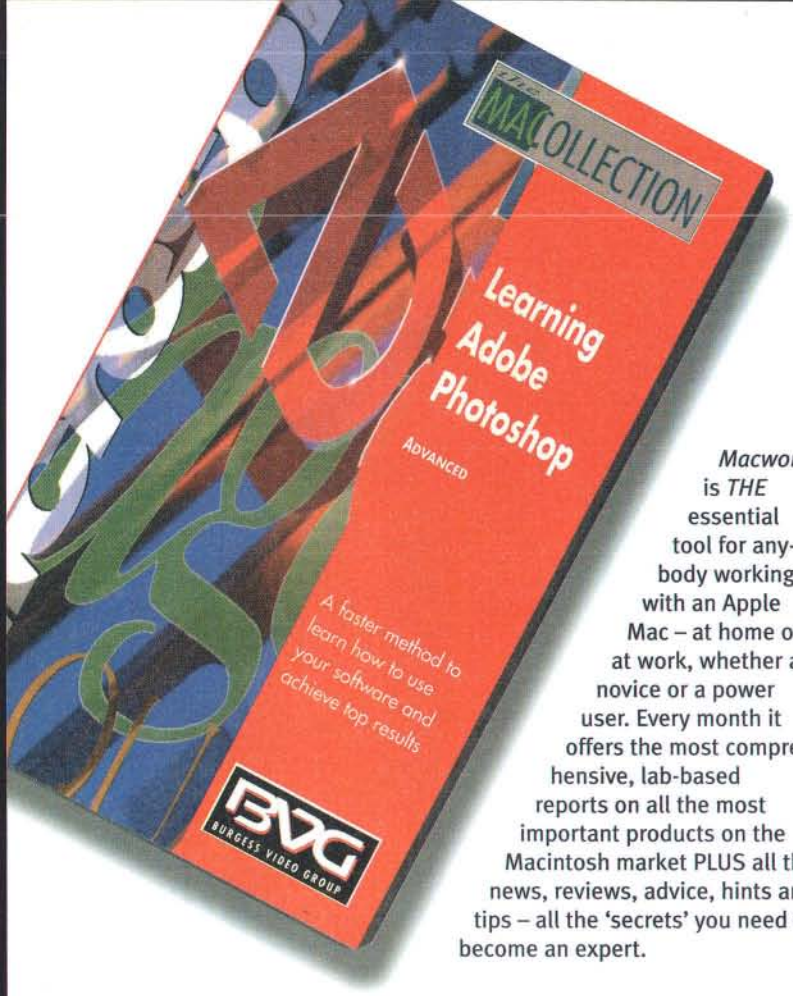
Audio utilities and QuickTime movie editors can also export and import Audio Interchange File Format (AIFF) files.

To play AU or AIFF files immediately after downloading them, a Web browser needs to launch an audio-helper application such as Norman Franke's freeware SoundApp.

Hearing audio while a file downloads requires a streaming technology such as Progressive Networks' RealAudio (**http://www.realaudio.com**). RealAudio 2.0 uses a higher sampling rate and provides significantly better quality than the previous version, but you need a 28.8Kbps or faster connection.

New streaming technologies that rely on MPEG compression include StreamWorks from Xing Technology (**http://www.xingtech.com**) and MPEG/CDE from Kauai Media (**http://www.electriciti.com/kauai**).

Tip: Provide audio files in a compact, low-fidelity form and in a larger, high-fidelity form, and let Web site visitors choose.



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Expert Graphics

Graphics professionals share their secrets

Artist: Hannah Gal is a photographer and illustrator whose work has appeared in *Creative Technology* and *Electronic Imaging* publications. Hannah is also a regular contributor to the *British Journal of Photography* on digital imaging matters.

How it was done: The 'Holding Hands' image was created for Adobe's yearly calendar competition 1996. The theme this year was communication.

Both Photoshop and Fractal Design Painter were used to create this image. The latter's ability to read Photoshop files and transfer layers with even original masking intact makes it possible to enjoy the best of both programs.

The original 35mm black and white negative was scanned into Photoshop. It was then turned 2 degrees clockwise for a squarer composition. The gaps around the image, created by the move were filled with Photoshop's cloning tool, cloning the far edges of the image.

The Photoshop file was then opened in Painter. With the marquee selection tool a square was created around 'busy' finger area. The next step was to add warmth through colour to the selected square. Rather than simply paint over it or just fill the area with colour, Hannah opted for coloured lights.

The unique effect was achieved with Painter's Apply Lighting option. Unlike Photoshop, Painter lets you apply these effects to a greyscale image without converting to RGB first.

With blue and warm yellow as main light colours, high ambient light and high spread, lighting effects were applied to the selection.

Apply Texture in Painter was used with Paper Grain, inverted setting to create a softer image.

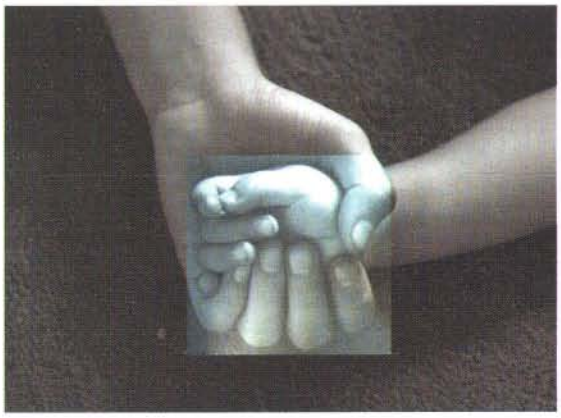
The image was then re-opened in Photoshop and the KPT 3 Noise filter was applied for extra softness. With the lasso tool, areas around the four corners of the square were selected and lightened.

In Photoshop, the selection was inverted and the black and white hands were darkened slightly and Levels applied. MW

by Mandie Johnson

Step 1: Original black-and-white negative is scanned into Photoshop. For the desired straight horizontal line the whole image is rotated 2 degrees to the right.

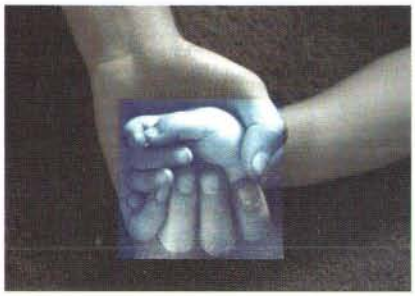
The white gaps created by this move were filled using Photoshop's cloning tool – cloning the edges of the image.



Step 2: The Photoshop file is saved as a greyscale TIFF and opened up in Painter.

With the marquee selection tool a square is drawn around the 'busy fingers' area, and lighting is applied.

Light colours are specified as blue and warm yellow. The spread option is set to the widest possible measurement and the ambient option given the highest specification.



Step 3: Still in Painter, texture is applied using an inverted Paper Grain setting.

Step 4: The image is taken back into Photoshop and the KPT 3 filter Noise is applied.

Using the lasso tool, areas around the four corners of the selected square are selected and lightened to match entire image.

Step 6: Finally the selection is inverted, ensuring that only the area outside the 'busy fingers' square is selected and darkened by adjusting the levels.

Tools

Hardware: Power Mac 7500/100 with 38MB of RAM, 17" Idek monitor.
Software: Adobe Photoshop 3.0; Fractal Design Painter 4.0

Expert Publishing

Cropping and clipping

by David Blatner

Maybe you want to get rid of your ex-spouse. Or perhaps it's the background behind a gift that has to go. No, I'm not using get rid of in the mobster sense – I mean "remove from a photograph." In the real world, if you don't like something in a picture, you take out a pair of scissors and trim it off. In the electronic world, cropping and clipping is a little more complex. In this article I focus on cropping bitmapped images.

Printing a cropped image can take 20 minutes or two minutes depending on what file format you use to save the file. In real life, each photograph or negative takes about the same amount of space. But in the electronic ether, every image bit takes up space on your hard drive, in RAM, and – when you print – in traffic over the network.

Cropping the image data

If you crop an image in Adobe Photoshop (or in a similar image-editing program) and then save the file with exactly the same name, the program throws away the cropped pixels – you can't go back and retrieve that image data (see "Cropping in Photoshop"). Because the new image contains fewer pixels, it takes up less space on your hard drive and in RAM, and makes less traffic on the network.

Cropping and page layout

If you crop an image in a page-layout application, like Adobe PageMaker or QuarkXPress, the full image remains available to the application. It's simply not all visible on the page (this is also true for Adobe Illustrator and Macromedia FreeHand). That is, the application doesn't modify the original file on your disk, so you can always go back and change your mind (see "Page layout and cropping").

However, the entire image (or a low-resolution preview of it) also remains inside your page-layout file, taking up space. Let's say your design calls for three head shots, but all you have is a group photo. Don't import the picture into your page, crop to select the first head, then import the photo again and crop for the second, and so on. Instead, use Photoshop's cropping to isolate each head and import the three small files individually.

When you print your document, the page-layout program uses either of two methods to crop the image, depending on the image's file format.

Either the program sends just the image data it needs to output the cropped image to your PostScript printer, or it sends the entire image to the printer along with instructions on how you want to crop it (called a clipping path).

TIFF versus EPS

When you crop a TIFF image in QuarkXPress or PageMaker, the program sends only the image data necessary to print the job. On the other hand, if you have a 10MB EPS (encapsulated PostScript) file and you crop it down to a small square, the program sends all 10MB to the printer when you print your page. That means using TIFFs can offer incredible time savings every time you print.

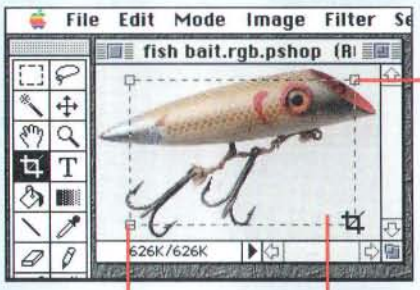
Sometimes, however, you have to use an EPS – for duotones or clipping paths with XPress, for instance. In that case, first crop the image in Photoshop to get the smallest file possible. (By the way, you already know you shouldn't use PICTs, right? They're not suitable for professional print publishing work.)

Time-consuming calculations

When the printer receives a clipping path, it performs the time-consuming task of carefully clipping out the unneeded parts of the image. Note that a clipping path is always a set of lines or curves, just like those from

Cropping in Photoshop

To crop a scanned image in Photoshop, either use the crop tool, or make a rectangular selection with the marquee tool and select Crop from the Edit menu. In either case, Photoshop discards pixels; after you save the image, you can't get them back.



To rotate and crop at the same time, hold down the option key when you drag. Move the cropping rectangle by holding down the key and dragging a corner

Resize the cropping rectangle by dragging a corner

When you're ready to make the crop, click inside the rectangle. To cancel the crop, click outside the rectangle

Selecting crop from the edit menu discards everything outside the selection.

FreeHand or Illustrator – you can't have a clipping path with soft edges.

Let's say in real life you want to crop a photograph to a smaller rectangle with a pair of scissors. That's fast, right? Four snips and you're done. But if you want to pare it down to an oval, that might take you a little longer. PostScript printers have the same problem. The more curves or lines make up the clipping path, the longer the printer takes to perform the task.

Clipping paths

You can make a non-rectangular crop in Photoshop, Illustrator, or FreeHand by drawing your own clipping path. In Illustrator you use the Mask feature; in FreeHand you use Paste Inside. In Photoshop you use the path tools, save the path with a name, then set it to be a clipping path (see "Photoshop clipping paths").

You now save the image as a TIFF or an EPS. However, at the time of this writing, only PageMaker recognizes TIFF images that have embedded clipping paths.

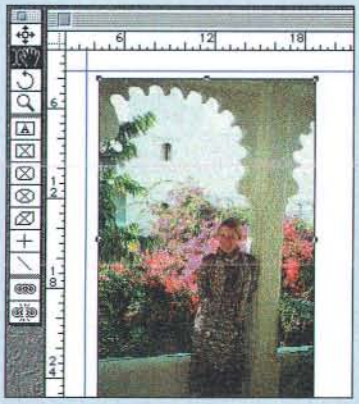
Clip or crop

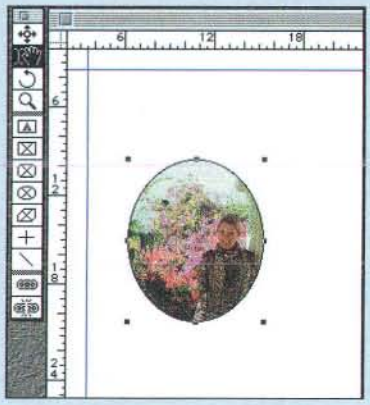
While many operations are easier on a computer than in the real world, it's clear that cropping and clipping are not among them. Seemingly minor differences in how you crop can be costly in minutes (which translate to pounds) spent on a project. I like using TIFFs whenever possible, especially when I might be cropping in my page-layout application. My first choice is always to crop the image even before I get to PageMaker or QuarkXPress. MW

David Blatner is the co-author of several books, including Real World Photoshop, The QuarkXPress Book, Real World Scanning and Halftones, *and* QuarkXPress Tips & Tricks *(all Peachpit Press).*

Page layout and cropping

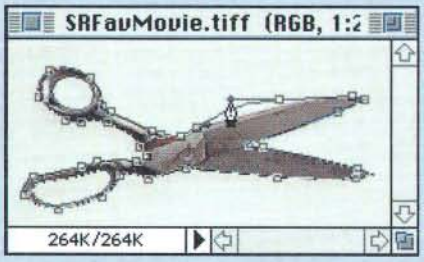
When you crop an image in a page-layout program, you can always recrop for a different effect. In PageMaker you can use the cropping tool or the Mask feature. In QuarkXPress you make the picture box smaller or change it to a different shape (like a polygon or an oval).



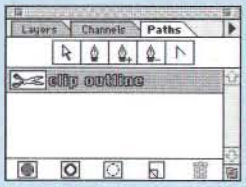


Photoshop clipping paths

PostScript clipping paths can be any shape, but the file can take a long time to print or, if the paths are very complex, may not print at all.

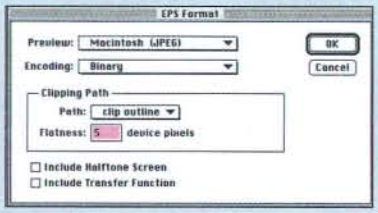


1. Use the pen tool to draw Bézier paths in Photoshop. One path can contain multiple, unconnected paths.



2. Save the path in the Paths palette by double-clicking on the path.

3. If you use PageMaker 6, you can save the image as a TIFF file. Choose Clipping Path in the Paths palette to turn the path into a clipping path.



4. If you save the image as EPS, set the path as a clipping path. Don't forget to set Flatness to 4 or 5.

5. The final printed image with the hard-edged clipping path.

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- Resolution: 300 dpi

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Textile transfer media
Ribbon Type:
Black, 3 colour, 4 colour
Feeder Capacity:
paper: 100 sheets
transparency film: 50 sheets
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Series 6613
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Parcel post – Internet-style

by Cameron Crotty

ROBERT PURNELL

The season to be jolly may be long past, but few bad memories linger like holiday postal memories. Finding just the right gift for Aunt Gladys was nothing compared with the hours spent wrapping it in bubble-pack, nesting it in multiple boxes, and dumping in cups of packing popcorn, all so that the glass tchotchke you bought would arrive whole and not in shards.

Sending files by e-mail is faster than relying on snail mail, but your electronic messages can receive treatment every bit as rough as the caresses of the mail-delivery services. And if you don't package your files properly, they might arrive in tiny, mangled pieces.

So what happens to files sent via Internet e-mail, and how can you protect yours?

Why encode?

To send Aunt Gladys's memento, you need enough padding to survive the crushing blows delivered by conveyor belts and other parcels. On the Internet, the crushing blows come from Internet mail servers, all of which process only text messages, and some of which deal harshly with overlong messages.

This isn't a problem if you're sending unformatted text files, but those mail servers make a quick hash of any other type of file. Known collectively as *binary* files, these include image files, sound files, applications, QuickTime movies, and formatted text documents. In order for binary files to survive, they must be *encoded* as ASCII text.

Feeding a binary file through an encoding program produces a text file that looks like a monkey has been slapping your keyboard, but contains all the information in the original file. You can attach the text file to an e-mail message, or you can copy the encoded text and paste it directly into your e-mail. Since the file is now unformatted ASCII text, you can send it through any mail server, and once the file arrives, the recipient can use software to *decode* the text, reconstructing the original file.

There are a number of quality shareware tools for encoding and decoding binary files, and I'll talk about them as I describe specific protocols. But if you spend a lot of time sending and receiving files over the Internet, I highly recommend purchasing StuffIt Deluxe from Aladdin Systems (Principal, 01706 832 000; £80). Not only is the StuffIt compression protocol one of the most popular in the Mac community, but it handles just about any compression and encoding protocol you will find on the Net, including most of the weird Unix and PC-compatible stuff.

How to encode and send

There are three main ways to encode binary files for the Internet: BinHex, UUCode, and

continues page 140

Web worthy

Access the MIME FAQ at **http://www.cis.ohio-state.edu/text/faq/usenet/mail/mime-faq/top.html** for more info.

Likewise, the FAQ for **http://www.cis.ohio-state.edu/hypertext/faq/usenet/macintosh/comm-faq/top.html** is loaded with lots of useful telecommunications information.

The WWW Viewer Test Page site, **http://www-dsed.llnl.gov/documents/WWWtest.html**, offers several document types so you can confirm that your file viewers are properly installed. One test lets you send e-mail messages with MIME attachments.

And for more info on BinHex, visit **http://www.natural-innovations.com/boo/binhex.html**.

MIME. Of these, UUCode is the oldest and MIME has the most future promise, but BinHex is a protocol that every Mac Net surfer should know.

BinHex If the Macintosh hadn't come along, we'd probably all still be sending each other UUCode (uuencoded) files. But the Mac OS has a two- pronged file structure – that is, every Mac file has a data fork and a resource fork. Generally, uuencoding isn't a problem when transferring data files such as sounds or images. But uuencoding completely ignores a file's resource fork.

Enter BinHex, an encoding scheme that preserves the Mac's dual-fork file structure. BinHex is the most popular encoding method used on Internet Macintosh archives – you can generally recognize a BinHex file by its suffix, .hqx. Most Internet archives are Unix-based, and an encoded file can be simply stored as a text file, regardless of the operating system it originated on.

While StuffIt Deluxe is my commercial recommendation, for shareware stalwarts who need to decode BinHex files I recommend StuffIt Expander; Compact Pro from Cyclos and HQXer are also solid utilities for encoding and decoding BinHex files. Note: Do not use BinHex 5.0 – it is not simply an upgrade of BinHex but uses a different encoding algorithm, making your files unreadable by other BinHex-decoding software, and it is unreliable.

UUCode UUCode was originally developed for Unix users to trade binary files using ASCII transport mechanisms. It's still in use in Usenet newsgroups, where you can download uuencoded image and sound files. You'll recognize such files from their suffix, .uu. Jeff Strobel's shareware UULite is a top-flight utility.

For a protocol, UUCode is pretty rude – it generally ignores file types and headers – but it has widespread acceptance on the Net (mostly by the Unix crowd). Just remember: UUCode does not recognize the Mac's dual-fork file structure.

MIME MIME stands for Multipurpose Internet Mail Extensions, and it's a different approach. MIME is an attempt to build a standard to encode and transmit, then identify and decode, non-ASCII data. MIME messages are encoded text, but they also contain detailed information so that, ideally, your recipient's e-mail program can read the message, identify and decode the encoded parts, and display the entire thing. So you could use multiple font sizes, bold, italics, some in-line graphics, and a sound clip.

Unfortunately, not many e-mail programs specifically support MIME; three that do are Eudora Pro from Qualcomm (Electric Mill, 01223 501 333; £60), the e-mail client in InterCon's TCP/Connect II (Principal, 01706 832 000; £134), and Claris Emailer (not yet available in the UK; watch this space for availability, or call 0800 422 322). If you want to try manually sending MIME messages, Mpack (Macintosh version by Chris Newman) encodes and decodes MIME parts for you, and can also decode BinHex and uuencoded files.

Online services If both you and Aunt Gladys subscribe to the same online service, then you're in luck. CompuServe supports sending binary enclosures to other service members. You will still want to compress your attachments to reduce transfer times, but don't bother encoding anything.

But CompuServe does not allow members to send or receive attached files from the Internet. If you want to send a file, you have to encode it, and then paste the encoded text into the body of an e-mail message.

Why compress?

It's generally a good idea to compress files before you encode them, for the simple reason that transferring smaller files saves time and money. Compression is especially important when sending files over the Internet, as encoding a file usually increases its size. Also, compressing a file gives you the opportunity to protect it with a password, providing you with some level of security. Keep in mind that adding a password to a compressed archive is like locking your car doors: it will keep out frivolous malefactors, but a determined thief will figure out how to bust a window and grab your stereo.

If you choose to compress a file, either make sure that your recipient has the appropriate decompression software or create a self-extracting archive. A self-extracting archive (often identified by the suffix .sea) builds the decompression software into the compressed archive, so the file will automatically uncompress.

If the file is larger than 64K, an Internet mail server may *segment* your message and deliver it in two or more bite-size chunks. If you receive an encoded message in two chunks, simply use a text editor to paste the sections back together, and send the file through a decoder. If the file is corrupted in the sending, ask whoever sent you the file to use an encoder to pre-segment the file and send it as multiple messages.

Getting your files from here to there over the Internet can be tricky, but with the proper tools and experimentation, the JPEG file you e-mailed to Aunt Gladys might get there in better shape than that glass knickknack.

• **New browsing news** Mac Net surfers should soon have more browser options. In the 3D space, Virtus (001 919 467 9700, info@virtus.com) is shipping the $29 Voyager VRML 3D helper application. Download a trial version from http://www.virtus.com.

• **More fetching Fetch** For those of you not using your Web browser to download files from FTP servers, version 3.0 of Fetch, by Jim Matthews, is available.

New features for the latest version of the Macintosh FTP client include bookmark lists, plus support for System 7.5 drag and drop, multiple connections, and native Open Transport code. The single-user license fee for Fetch is $25; for more information, browse http://www.dartmouth.edu/pages/softdev/fetch.html. MW

shareware picks

ON THE MACWORLD CD

This month's crop of Mac shareware tools will help you encode, compress, and send files via e-mail across the Internet.

Standing head and shoulders above other decoding and decompression utilities, Aladdin Systems' StuffIt Expander is fast, free, and can handle nearly anything except for MIME-encoded messages.

Those interested in more-focused utilities should try HQXer, a BinHex file encoder/decoder; UULite, a shareware UUCode utility; or Mpack, a tool for encoding and decoding MIME messages.

Encoding a file may protect it from the e-mail gorillas, but compressing it will protect you from excessive connect charges. Compact Pro, from Cyclos, can compress and expand files, encode and decode using BinHex, and create self-extracting archives.

Once your file is packaged up, you can send it with Eudora Light, a freeware version of Qualcomm's Eudora Pro e-mail client.

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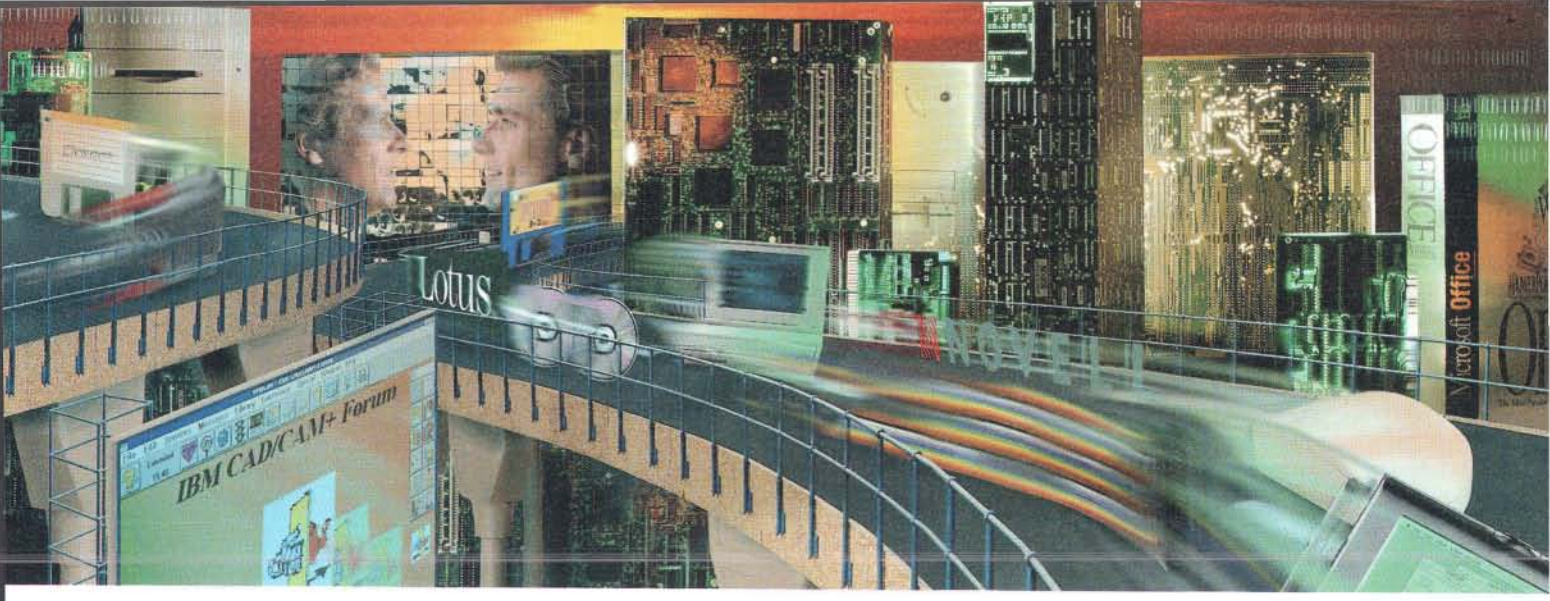

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Comedy of errors

What do those error messages really mean?

by Joseph Schorr

GEORGINA WATSON

The next time you find yourself staring at your Mac's frozen screen with a mysterious Type 1 error message flickering over your lost work, think about this: The Macintosh Operating System is capable of displaying more than 280 error messages. If you've seen only a handful of them, cheer up. Think of the hundreds you've managed to avoid.

OK, that's not terribly comforting. Maybe you've never had your day ruined by the sinister "Couldn't find 5 nybbles in 200 tries" (Error –66). Still, those morbid error messages you do see – and the crashes that accompany them – can make your blood run cold. But what if you really understood what all those messages and code numbers meant? Wouldn't that help you zero in on the root cause of your crashes? Wouldn't you be able to head off such tragedies in the future?

Don't kid yourself. Oh, it's true that every one of Apple's error codes does have a precise meaning that isolates a specific problem on your system. But frankly a lot of these cryptic error messages don't mean much to anyone but programmers. On the other hand, some error codes do contain clues that can help you track down a stubborn problem. Serious troubleshooters should know which codes to ignore and which provide genuine clues. Here are a few guidelines.

Don't believe everything you read

It would be great if your Mac could tell you exactly what went on in the aftermath of a crash. In reality, the Mac's error codes aren't nearly that precise – or enlightening. For one thing, the error definitions themselves provide you with little information that you can actually use unless you're a programmer. Knowing that an "unimplemented core routine" (Error 12 or Error –4) caused your crash doesn't shed much light on why a program keeps crashing. Most error codes contain technical information a programmer could use to pinpoint a glitch in code, but they don't give you much to work with.

The second – and even more frustrating – problem is that the error messages you get in a crash are often completely wrong; for example, the Mac might say you had an "illegal instruction" problem (Error 3) when in reality you simply used up all your RAM. Following the clues given by an error message could lead you down a blind alley.

continues page 162

Warning!: your day has been unexpectedly ruined

Here are a few other common error messages and the problems they point to:

"Application unexpectedly quit" Applications quit without warning when they either run out of memory or encounter a conflict with an incompatible (usually out-of-date) system extension. A Type 1 error often means your program ran out of memory. The application tried to access a chunk of memory that didn't exist or needed more RAM than was available.

You can remedy the problem by allocating more memory to the program, adding more RAM to the system, or simply restarting your Mac so the RAM available is in contiguous chunks.

A Type 2 error is also related to memory use. The Mac tried to store a chunk of data in an address that couldn't hold it. A Type 3 error is called an illegal instruction error. It means the Mac tried to execute an instruction that isn't part of its standard vocabulary. The cause may be an out-of-date system extension or hard disk driver.

Errors 17 through 24 These errors indicate that the Mac tried to access one of the standard routines in the System file and couldn't find it. In all probability, that means you have a corrupted System file. Try installing a new System file to replace the damaged one.

Error 25 Once again, you've run out of memory.

Errors 26, 27, 30, 31 Apple says these errors tend to appear when your System file has got mangled. Replace it.

Error 28 This error is accompanied by the message "Stack ran into heap," but that's just another way of saying you ran out of memory.

Type 11 Error Don't look for specifics here. On a Power Mac, a Type 11 error can mean almost anything. It simply refers to an error that occurred in reading native Power PC code. Usually it means a bus error, an address error, or an illegal instruction.

Error –39 A –39 error is usually accompanied by the message "end of file" or "no additional data in the format." This error points in the general direction of a corrupted file. It means that the Mac started to process a file but couldn't finish reading it. If you encounter this message at start-up, it could mean that the Launcher has become corrupted. Drag the Launcher control panel into the Wastebasket and reinstall it.

The bad F-line fallacy

Here's a classic case of a fallacious error message: Power Macintosh users frequently get two error messages, one that says "FPU not installed" and another that says "bad F-line instruction." They get both of these closely related messages despite the fact that Power Macs do have an FPU (floating-point support has been integrated right into the PowerPC chip), and they aren't using a program that requires an FPU anyway.

Why does this happen? One reason is that on 68oXo Macs, the CPU and the FPU send code back and forth using a special set of instructions (called F-line instructions because they always start with the letter F). Every so often, due to one glitch or another, your Mac may encounter a piece of code it wasn't supposed to read – code that, coincidentally, starts with the letter F. The CPU interprets the code as an F-line instruction.

Of course, your Mac can't carry out this instruction, because the Power Mac doesn't have a separate FPU chip waiting to receive the instruction, so you get a "No FPU installed" or "Bad F-line instruction" message. In reality, the cause was most likely an extension conflict or a program that needs to be upgraded, and has nothing to do with FPUs or F-lines.

Decoding error codes

Does this mean all those error codes are worthless? No; in many cases the codes can point you in the general direction of a problem. In the example given earlier, the "unimplemented core routine" (Error 12) is a strong indicator that you're dealing with an honest-to-goodness software bug. It means the programmer placed a temporary break in the code for use in debugging but forgot to remove it before releasing the final code. If you can reproduce the error, it's a pretty clear indication that you need to contact the software vendor to report the bug and ask for a patch or an update. MW

Joseph Schorr is co-author of Macworld Mac and Power Mac Secrets, *third edition (IDG Books Worldwide, 1996).*

When all else fails

There are hundreds of error messages you may see on your Mac, but the most common are caused by only a handful of problems: a system extension conflict, a corrupted file, or lack of memory. If you're plagued by relentless Type 1, 3, or 11 errors, follow these troubleshooting procedures to wipe out the problem.

1. Turn off all extensions by restarting the Mac while holding down the shift key. If the error disappears, you know it's a corrupted or out-of-date extension or two conflicting extensions. Try to isolate and get rid of the conflicting extension. (You can use System 7.5's Extensions Manager or a third-party utility such as Casady & Greene's Conflict Catcher 3 to turn extensions on and off selectively.)

2. Update the hard-disk driver. Older SCSI disk drivers are known to conflict with SCSI Manager 4.3 and generate some of the errors described above. You can update the driver by running Apple HD SC Setup version 7.3.5 or by using a third-party drive-formatting utility.

3. Zap the Mac's parameter RAM (PRAM) by restarting the Mac while holding down 1-option-P-R. (PRAM is the chunk of memory used to preserve various preferences and settings on your Mac.)

4. Perform a clean install of the system software, replacing the entire System Folder.

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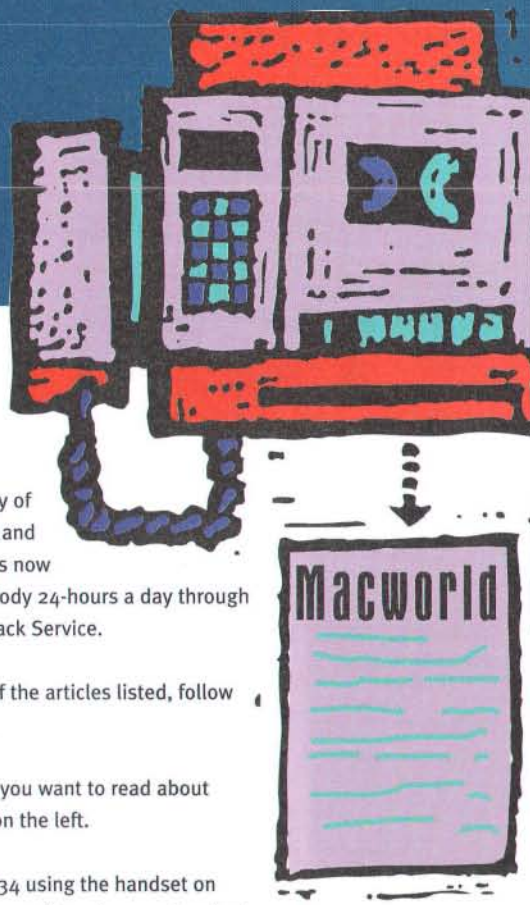

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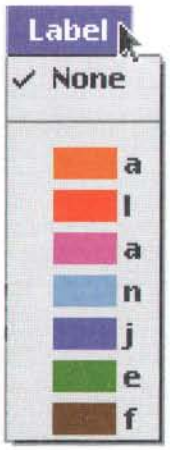

Label mates
Apple programming wags Alan and Jef included this nominal Easter egg in the Finder just to confuse delete-happy Macintosh users.

LON POOLE answers readers' questions and selects reader-submitted tips for this monthly column. His latest book is Macworld System 7.5 Bible, *third edition (IDG Books, 1994).*

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LocalTalk joins ethernet

Q My Power Mac 7500 has a LocalTalk connection through the printer port to a LaserWriter Select 360, and an EtherTalk network connection through the Power Mac's built-in 10BaseT ethernet port. When I select EtherTalk in the Network control panel, I can no longer access the LocalTalk LaserWriter. How can I get my Mac to access EtherTalk and LocalTalk simultaneously?
Robert Forstot

A Apple's free LaserWriter Bridge 2.0 software may be just what you need. It allows you to have a primary network connection to ethernet simultaneously with a secondary network connection to LocalTalk. After installing LaserWriter Bridge, set your primary network connection by selecting EtherTalk in the Network control panel.

Then establish a secondary network connection by turning on the LaserWriter Bridge control panel. The software comes on the System 7.5 Update CD (contact Apple on 0800 127 753), and you can get it online as part of Network Software Installer 1.5.1: world wide web (**http://www.support.apple.com/wwwdocs/apple_sw_updates.html**).

An ethernet network can include any number of Macs with active LaserWriter Bridge software, but each Mac must be connected to a different LocalTalk network.

In other words, each LocalTalk segment can have only one Mac with active LaserWriter Bridge software.

You control whether LaserWriter Bridge allows other Macs on the ethernet network to access all printers connected to your LocalTalk network.

LaserWriter Bridge can theoretically handle 32 printers, but to ensure adequate network performance, Apple recommends eight or fewer. If you prefer, you can designate your LaserWriter Bridge as private.

Other Macs on the same LocalTalk network segment as the LaserWriter Bridge can access only devices on that LocalTalk segment.

If they need access to printers, file servers, or other network services on the ethernet network (including printers connected through LocalTalk Bridge software to the Ethernet network), you can install Apple's £75 LocalTalk Bridge software where it establishes a two-way bridge between LocalTalk and ethernet networks.

LaserWriter Bridge and LocalTalk Bridge also work with Token Ring as the primary network instead of ethernet.

An accidental Easter egg

Q The text in my Labels menu has been replaced mysteriously with the seven letters alanjef (obviously two names), with one letter next to each label colour. Also, sometimes the Finder's Page Setup and Print Desktop commands are dimmed. What's going on?
David Katz

A The Labels menu change is an Easter egg that appears when you delete all the text in the Labels control panel. To get rid of it, enter some text for each label and restart (the original labels are Essential, Hot, In Progress, Cool, Personal, Project 1, and Project 2).

The Finder's Page Setup and Print Desktop commands are disabled when certain windows, such as About this Macintosh, the Clipboard, the Launcher, (or another control panel) are active. Click any icon or the desktop to enable those commands.

Server log-in shortcuts

tip When logging on to an AppleShare server or a System 7 file-sharing server through the Chooser, you can press ⌘-R for Registered User or ⌘-G for Guest. Eliminating an extra trip to the mouse, this shortcut is especially nice for keyboard-oriented folks.
Mark Altenberg

Instant reprints – nearly

Some documents take quite a while to spool for background printing, and that's on top of the time it takes to open the application and the document before you can begin printing. For example, I have Photoshop files that take several minutes to spool for printing on my Colour StyleWriter. I like to share prints of those pictures with my friends, but to conserve ink I rarely print more than one or two copies at a time.

I devised this procedure – using Apple's desktop printing software – for eliminating spooling delays.

Before printing a file for the first time, select the desktop printer icon and choose Stop Print Queue from the Finder's Printing menu. Then print the file, causing a spool file (which the Finder calls a Desktop PrintMonitor document) to be created for the desktop printer. If you forget to stop the print queue before printing, immediately go to the Finder and stop the print queue or open the desktop printer icon and put the print request on hold.

Next open the desktop printer icon and drag the spool file to any folder. When you're ready to make a print, hold down the option key and drag the spool file from that folder to the desktop printer icon. This makes a copy of the spool file for the desktop printer and leaves the original spool file untouched for future reprints. If necessary, use the Finder's Start Print Queue command to start up background printing. Et voilà! Reprints without spooling or opening a document and its application!
Komra Moriko

You can get the desktop printing software from Apple's online sites (listed above in "LocalTalk joins ethernet") as part of the LaserWriter 8.3 package or the Colour StyleWriter 2400 package. The desktop printing software works with most Apple printer drivers, such as the StyleWriter II, StyleWriter 1200, LaserWriter 300, LaserWriter Select 310, and earlier versions of LaserWriter. – L.P.

Truth about suffix removal

By itself Aladdin's free StuffIt Expander software can decompress or decode only four types of files – those whose names end with .sit, .cpt., .hqx, or .bin – not the

continues page 166

Q&A

long list of file types listed in January's Q&A.

Doug Reider and other readers correctly state that you need to add Aladdin's $30 shareware DropStuff with Expander Enhancer to handle the rest of the listed file types – those whose names end with .zip, .zrc, .pkg, .gz, .z, or .uu. Both DropStuff and StuffIt Expander are included with StuffIt Deluxe, but neither one comes with StuffIt Lite.

Easy error bars

It turns out there's an easier method than the one presented in January's Q&A for adding different error bars to individual data points in an Excel 5.0 chart.

According to Sally Swedine and other *Macworld* readers, you should lay out the data to be graphed in the usual manner, with the x-axis data in one worksheet column and the y-axis data in the adjoining columns.

Use additional columns for the amounts that specify the lengths of the custom error bars. Create the chart, and then select one data series by clicking a data point on the chart (if the chart is not already selected for editing, click it and then click the data point).

Choose Error Bars from the Insert menu to bring up the Error Bars dialogue box and in it enter the cell range that specifies the custom error-bar amounts for the selected data series, as shown in "Adding error bars." Close the dialogue box and then use the Error Bars command again on each remaining data series.

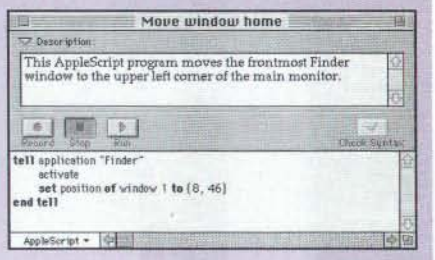
The science of window arranging

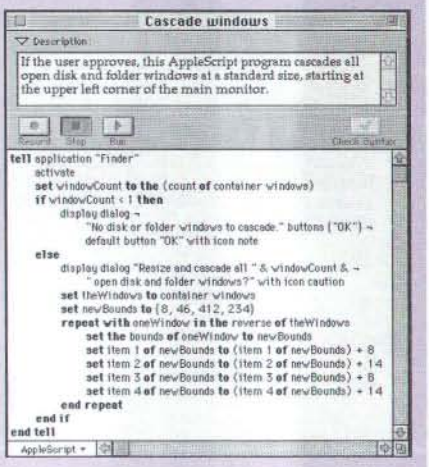
I often copy a folder from a computer with a large screen area to another computer on the network with a small screen area. If the folder's window was positioned in the lower-right corner of the large screen, I sometimes can't see any part of the window when I open the folder on the small screen. I can't resize the window or work with its contents. The same problem occurs when I open some DOS disks that were last opened on a computer with a large screen. How can I force a folder or disk window to a viewable place?

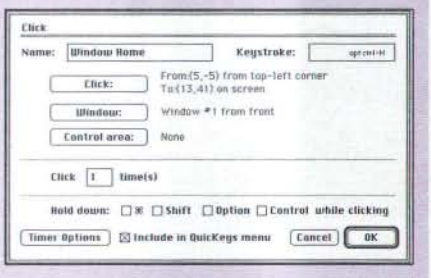
DavidMP
via the Internet

The symptoms you describe surprise me because the Finder should position a window so that at least a part of its title bar is visible. It's then a simple matter to drag the window until you can see its zoom (grow) box, and resize the window to fit the screen. But even that chore becomes tedious if you have to do it repeatedly. You can use the Script Editor application that comes with System 7.5 to create a simple AppleScript program that moves the frontmost Finder window to the upper-left corner of the screen, or a somewhat more complicated script that makes all open disk and folder windows a standard size and cascades them from top to bottom.

If you don't have System 7.5, which is the earliest version with AppleScript and a scriptable Finder, you can use a utility such as QuicKeys to create a macro that moves the frontmost window to the top left corner. "Window Movers" shows the two scripts and a QuicKeys macro.





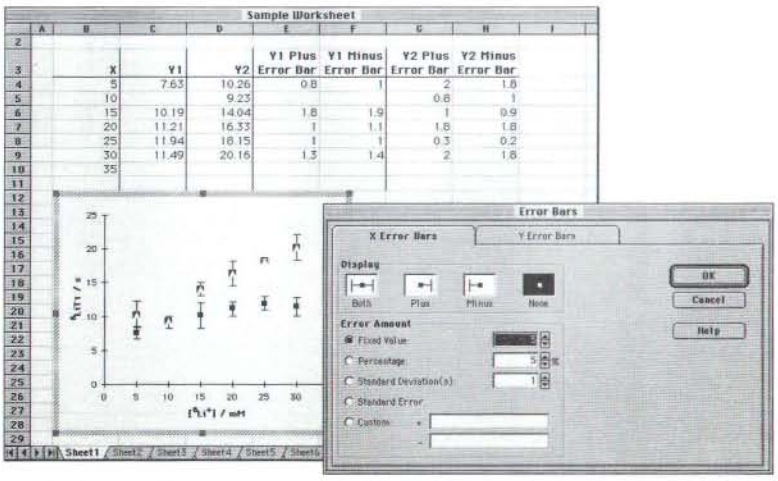


Window movers

These two AppleScript programs (top and middle) and the QuicKeys shortcut (bottom) rearrange Finder windows.

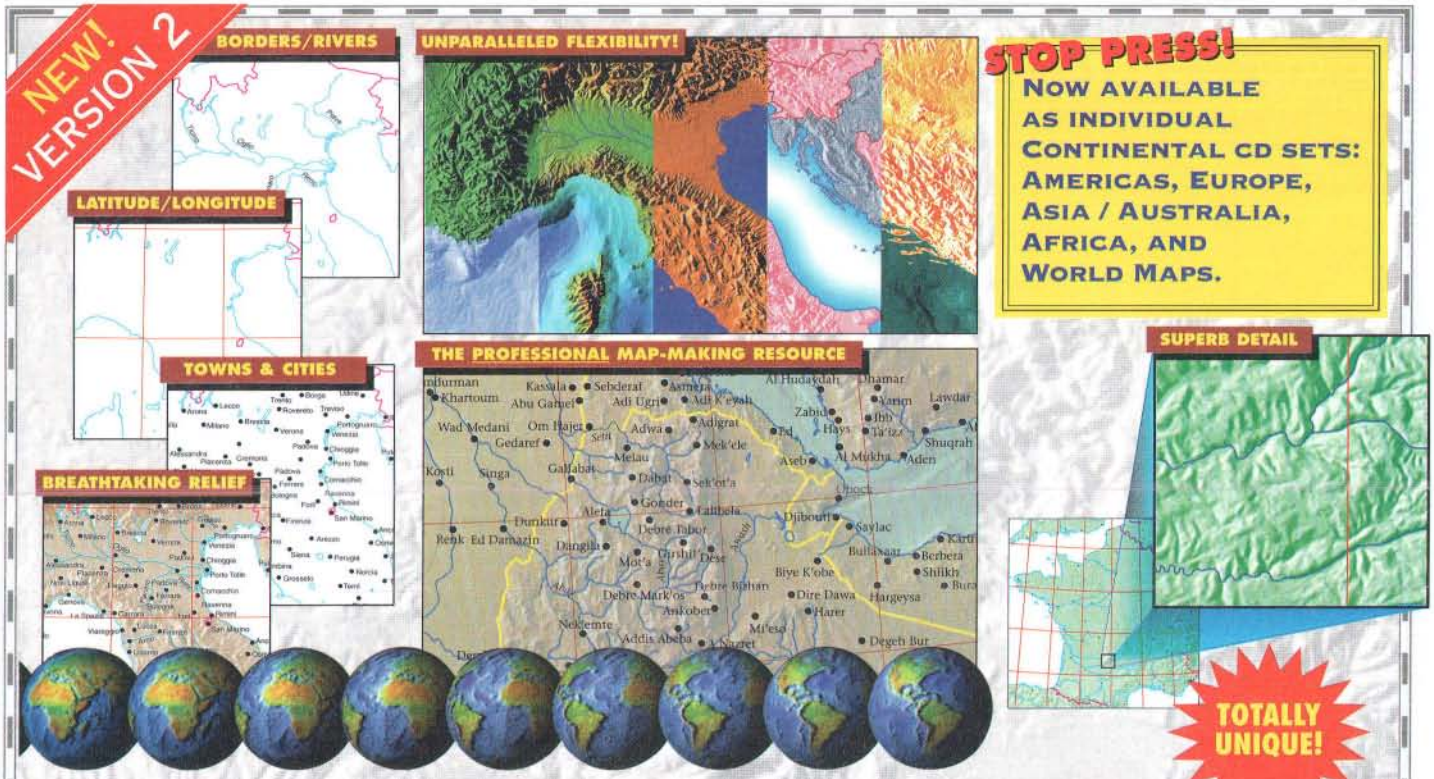
Make sure to save your script with the Kind option set to Application and the Never Show Startup Screen option turned on. For easy access you can put them in the Automated Tasks folder inside the Apple Menu Items folder.

If you use Speech Recognition, put an alias of each script application in the Speakable Items folder. To create the QuicKeys shortcut, you define a Click shortcut whose Window option is set for the first window from the front and whose Click options are to click at coordinates x = 5, y = –5 relative to the top left corner of the window and drag the window to co-ordinates x = 13, y = 41 relative to the screen.



Adding error bars

In Excel 5.0's Error Bars dialogue box you can add custom error bars to the data series currently selected in a chart. Near the top of that dialogue box you select the direction in which you want error bars displayed – Plus, Minus, or Both. At the bottom of the dialogue box you specify the amounts to use for each direction you selected (Plus, Minus, or Both). You can specify the error amounts for each direction as an array formula or as a range of cells; you can define a cell-range reference by typing it in or by dragging across the cells.



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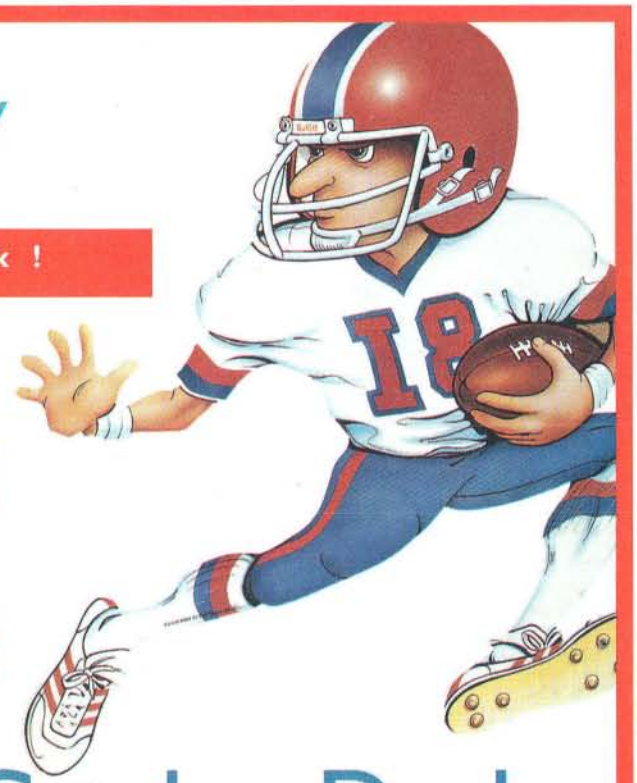

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Affordable colour printers

MW LAB

Macworld Lab tests six colour ink-jet printers

by Peter Stoller

Only a few years ago, "affordable, quality colour printing" was an oxymoron. Today, it's a standard term in the SOHO (small office/home office) lexicon – printed in four-colour liquid ink. Low-cost colour ink-jet printers are used daily for everything from colourful correspondence to eye-catching presentations. The available print stock – from plain paper to transparency film – helps make an ink-jet printer surprisingly versatile.

With this growing variety of applications has come a growing variety of printers. To help you pick the right one for your needs, we compared six current mainstream models. All work on the same principle: spraying dots of cyan, magenta, yellow, and (with one exception) black ink to reproduce a rainbow of colours. (The Canon BJC-210 combines the three primary colours to produce black.) That doesn't make the printers the same, though; indeed, we discovered just how different they can be.

Macworld Lab subjected the printers to a battery of speed tests, pumping out reams of text and complex graphics and photographs. Then we laid output samples before experts, who judged image quality. We found several good options – but the right choice depends on your needs.

KEVIN CANDLAND

Expect to be impressed

The strength of ink-jet printers is their ability to produce high-quality output at a reasonable cost. These machines print at resolutions as high as 720 dpi – higher than many laser printers. That doesn't mean better output, though. Ink soaks into paper, blurring details. But using special coated papers can reduce ink spread.

Our panel compared the printers' plain- and glossy-paper output of an Adobe Illustrator EPS graphic, an Adobe Photoshop colour photo, and a multifont Microsoft Word document.

The Canon BJC-4100 was the favourite in all the plain-paper tests, with the richest colours and clearest details. Apple's StyleWriters are based on Canon print engines, yet the StyleWriters' output was inferior to the 4100's; we credit the driver, from GDT Softworks' PowerPrint driver/cable package, for the BJC-4100's superior output. (We used GDT's software because it is the only Macintosh driver available – Canon does not provide a driver.)

That result surprised us. With its own driver, the StyleWriter 2400 prints at 720 by 360 dpi in black-and-white mode. The BJC-4100 with GDT's driver also supports 720 by 360 dpi, yet the BJC-4100's output quality was superior.

The Epson Stylus Pro has the highest resolution, 720 by 720 dpi. However, that resolution requires special paper; on plain paper

continues page 170

the Stylus Pro is restricted to 360 by 360. The Stylus Pro washed out on graphics at 360 dpi, but it did fine on text – which is what you'll care most about when printing on plain paper.

The Hewlett-Packard DeskWriter 660C was a distant last on the text test; its output was so oversaturated that the entire document appeared to be in bold type, even in Best mode at 600 by 600 dpi – the highest plain-paper resolution we tested.

When we switched to glossy paper, the Stylus Pro shone. At 720 dpi, it easily took the gold for the Photoshop and text tests. Unfortunately, it exhibited severe banding in otherwise excellent Illustrator output, giving the BJC-4100 with PowerPrint the edge.

But in our Illustrator test, Apple's 2400 gained an even bigger edge when we installed GDT's £149 StyleScript, an Adobe PostScript Level 2 interpreter just for StyleWriters. In fact, the 2400 jumped from the bottom of the heap to first place. The StyleScript output earned a nearly perfect score from the judges.

Holding down the low end were the HP DeskWriter 660C and Colour StyleWriter 2200. The former had poor colour accuracy and blocky text; the latter, a miniature printer geared toward travellers, produced slightly washed-out colours and lost some detail.

Colour ink-jet printers: quick facts on

Company	Printer	Star rating A	List price	Maximum resolution
Apple Computer	Colour StyleWriter 2200	✪✪✪✪/7.0	£290	720 x 360 black; 360 x 360 colour
	Colour StyleWriter 2400	✪✪✪✪/7.2	£350	720 x 360 black; 360 x 360 colour
Canon Computer Systems	BJC-210	✪✪✪/6.2	£259 B	720 x 360 black; 360 x 360 colour
	BJC-4100	✪✪✪✪/7.1	£349 B	720 x 360 black; 720 x 360 colour
Epson America	Epson Stylus Pro	✪✪✪✪/7.2	£459	720 x 720 D
Hewlett-Packard	HP DeskWriter 660C	✪✪✪/6.3	£335	600 x 600 black; 600 x 300 colour

A Based on features, innovation, performance, reliability, ease of use and value B Requires PowerPrint (£79; MacLine, 0181 401 1111) paper

Expect to wait for output

If quality output and cost-effectiveness are an ink-jet printer's strengths, speed is its weak spot, due to slow print mechanisms, serial-port bottlenecks, and dependence on the Mac for image processing. This last point means print speeds vary with different Mac models; note that only the Apple and GDT drivers are Power Mac-native.

Even with Power Mac-native drivers, print speed for a full-page graphic was about ten minutes in our tests. The DeskWriter 660C took two to three times as long. The Stylus Pro took a mere five to six minutes per page at 360 dpi, but switching to 720 dpi quadrupled print time – not surprising, since a 720-dpi image contains four times as many pixels as a 360-dpi one. (See "Performance: colour ink-jet's Achilles Heel.")

For printing black-only documents, Apple has an ace up its sleeve: the High-Performance Black Ink Cartridge, which is included, increased speed more than three times. (Canon projects similar performance gains with its black-only cartridges, now available as standard.)

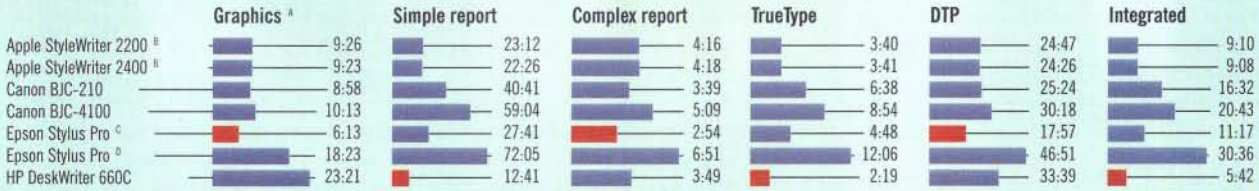
Driver settings also impact printing speed. In the most extreme case, the Stylus Pro printed text more than six times as fast when set to 360-dpi, high-speed mode, and black and white, than with standard settings. At two pages per minute, it performed fastest. At 720 dpi, however, text printing

MW LAB

Performance: colour ink-jet's Achilles Heel

The ideal colour printer would, of course, print instantly, produce perfect output, and cost nothing. But when you shop for a printer in the real world, you have to stake a claim somewhere within the three axes of the ideal. Colour ink-jet technology gets you pretty close to cost-free; it also gets you within sight of perfect output. Unfortunately, where colour ink-jet lets you down is in printing speed – some of the printers we benchmarked took several minutes per page, even on relatively simple documents.

Best result in test. Products are in alphabetical order. All times are in minutes:seconds. Shorter bars are better.



A Averaged scores of three tests (printer ranks and score spreads are similar in all three). B Performed some text-intensive tests about three times as fast when equipped with all-black cartridge than when equipped with standard four-colour cartridge. C Set for 360 dpi. D Set for 720 dpi.

BEHIND OUR TESTS

Macworld Lab tested the printers with a series of real-world files. The Graphics score is an average of print times for an Illustrator file, a Photoshop file, and a PowerPoint file; because none of the printers have built-in PostScript, print times for PostScript and non-PostScript graphics were quite similar, and other graphics applications should show similar performance. The text-intensive tests, in particular the Simple Report test with a single font in three styles, require little processing and are therefore good tests of each printer's print engine. The DTP and Integrated tests mix PICT, TIFF, and EPS images and coloured text in a variety of fonts to see how each printer copes with complex files.

We tested all printers on a Power Mac 7100/80 running System 7.5.1 with 24MB of RAM and an internal 700MB hard drive. All printers were connected to the serial (modem) port. Both Canon printers required GDT Softworks' PowerPrint. Drivers were configured for best quality. – **Macworld Lab testing supervised by Mark Hurlow and Jeff Sacilotto**

slow printing

Ports (included/optional)	Options	Warranty (in years)	Contact	Telephone
serial/none	Universal power adaptor £50; Battery attachment £90	1		0800 127 753
serial/LocalTalk £70	LocalTalk £70	1		0800 127 753
parallel/ [C]	BC-02 black as standard; BC-21 colour as standard (for limited period only)	3		0800 246 246
parallel/ [C]	As above; Also - Free copy of G2P Pressworks 2 High capacity black only £26	3		0800 246 246
parallel, serial-LocalTalk £130; EtherTalk £359	Epson PostScript interpreter with Pantone colour calibration £229	1		0800 220 546
parallel/none	none	3		0990 474 474

[C] PowerPrint/LT (£170 for 25 users) provides LocalTalk access [D] Requires Epson's special coated paper; restricted to 360 x 360 on plain

was so slow that we'd reserve it for applications where high-quality text is critical.

Fill 'er up

Refills are a substantial hidden cost of operating an ink-jet printer – up to £30 for colour ink alone. The Canon and Apple ink tanks ran out midtest. The Epson and HP cartridges didn't, thanks to their larger capacities. Epson's and HP's consumables are less expensive than the other vendors', but how much less is hard to gauge. Estimates for consumables' life spans vary widely from vendor to vendor, being based on different – and dubious – criteria. We didn't come close to Apple and Canon's estimated 100 pages per ink tank, for example, because we printed full-page graphics, while they base their estimates on far less ink per page.

You'll be refilling more than just ink wells, of course. All these printers come standard with a 100-sheet plain-paper tray, save the Colour StyleWriter 2200, which takes only 30 sheets. They all handle a wide variety of media types and sizes. At £10.50 for 100 A4 sheets, Epson's special 720-dpi paper isn't cheap, but some other premium coated papers cost as much.

Talking to the printer

Users can share Apple's StyleWriters via the bundled ColorShare software, but ColorShare ties up the host machine whenever anyone on the network prints. A £70 option adds LocalTalk networking to the Colour StyleWriter 2400, but that option is not available for the Colour StyleWriter 2200.

Epson offers both LocalTalk and EtherTalk options for the Stylus Pro, at £130 and £359, respectively. EtherTalk, though pricey, would really speed up those 720-dpi data transfers. For the Canon printers, GDT offers PowerPrint/LT (£170 for 25 users) for LocalTalk networking – not exactly economical compared with Apple's and Epson's hardware options. Only HP's DeskWriter 660C comes with LocalTalk as standard equipment.

For the best graphics in this bunch, get the PostScript option and the special paper – and a deck of cards for playing solitaire. If you print only business letters and bar graphs, the Stylus is overkill.

Getting set up

The Colour StyleWriter 2400 comes ready for the desktop, but batteries aren't included with the portable Colour StyleWriter 2200. For true portability, you need the £90 battery attachment. Both the DeskWriter 660C and the Stylus Pro lack a serial cable; the cable is less than £20 extra, but think how you'd feel if you got your new printer home and then discovered you couldn't use it.

Aside from this, setup couldn't be easier. Installing the ink cartridges is literally a snap. Then you just plug in a cable, run an installer, and restart. It shouldn't take more than ten minutes to get any of these printers up and running.

The last word

We weren't wowed by the DeskWriter 660C's poor output and speed, nor by Canon's also-ran BJC-210, but all the other printers are fine choices for the right user.

The Stylus Pro costs more than the other printers, but you get what you pay for in print quality and flexibility.

For the best graphics in this bunch of colour ink-jet printers, get the PostScript option and the special paper – and a deck of cards for playing solitaire. If you print only business letters and bar graphs, the Stylus is overkill.

The BJC-4100 and Colour StyleWriter 2400 are nearly identical. With PowerPrint, the BJC-4100 prints slightly better and costs slightly more.

Apple's printer comes with ColorShare, works with StyleScript, and has a relatively inexpensive LocalTalk option.

The BJC-4100, however, has a longer warranty and works with PCs; the StyleWriter is Macintosh only. Either one will nicely complement the average desktop.

Finally, the Colour StyleWriter 2200 is the only choice for colour printing on the go, and it's close to the equal of the Colour StyleWriter 2400 in output quality.

However, the high cost of consumables and the lack of a LocalTalk option make it appropriate only for road warriors. MW

COLOUR INK-JET PRINTERS

MW LAB Editors' Choice

Macworld Lab tested six colour ink-jet printers to compare for speed, colour accuracy and image clarity.

High End

/7.2 Epson Stylus Pro This printer is in a class by itself when it comes to output quality and features. For an ink-jet it's fairly expensive, but graphics professionals should consider it as a low-cost alternative to a dye-sublimation printer **Company:** Epson, 01442 61144 **List price:** £459.

Mid-range

/7.2 Colour StyleWriter 2400 TIt produces exceptional PostScript graphics with GDT StyleScript **Company:** Apple, 0800 127 753 **List price:** £350.

/7.1 BJC-4100 This printer noses past Apple's StyleWriter 240 in most output-quality categories. **Company:** Canon Computer Systems, 0800 246 246 **List price:** £349 (requires PowerPrint, £79).

Macworld reader offers reader offers re

Welcome to this month's reader offers pages. This month look out for some of the new items we have added including the latest Image Bank CD, an invaluable mobile desk for use on out-of-office business and of course, the stylish Macworld T-shirts and Polo shirts. And remember, there are even bigger discounts to be had if you're a subscriber so take out a subscription today and start saving money straight away!

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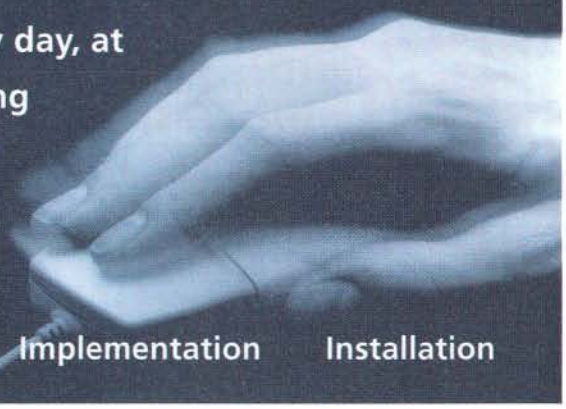

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Thinking of buying a Mac?

Apple's Macintosh computer is constantly evolving. A recent major shift in the Mac's internal architecture (from NuBus to PCI expansion boards, and from SIMMs to DIMMs memory cards) made buying decisions even more complicated. But Apple has gradually phased out the older architecture Macs, greatly simplifying matters. Then came the Mac-compatible computers (clones) from a growing number of manufacturers. The choices facing you are numerous. Stay calm, and practise these basic rules.

Processor: This is the brains of a computer. All Macs use the PowerPC processor these days, except the PowerBook 190. Just to confuse matters, the PowerPC 601 processor is more powerful than the 603, but not as powerful as the 604. A 603 processor is only about 75% of the speed of a 601 running at the same megahertz rate (see below), and half the speed of a same-megahertz 604.

Speed: Processor speed is measured in megahertz (MHz). The faster the better, basically – but bear in mind differing processor types, as mentioned above.

FPU: Also known as a maths coprocessor, the FPU is important in scientific, CAD and high-end graphics programs. For many people, the absence of an FPU will make no difference to their Mac's performance.

Expansion: Aside from drives, scanners and speakers, most hardware additions come in the form of boards or cards that slot inside the Mac. There are three types of board: PDS; NuBus; and PCI. Apple is now committed to PCI as its slot standard. Bear this in mind, if you already own NuBus or PDS cards – they will not fit in a PCI slot. A clever device on some Power Computing clones (called a riser) enables the simultaneous use of NuBus and PCI standards.

Memory: Also known as RAM, memory is a very important factor in your Mac's performance. The computer needs memory to run, even before you have launched a program – System 7.5 alone guzzles at least 5MB of memory. Add more fonts, extensions and system add-ons, and your 8MB Mac might not be able to run even the smallest application. Every Mac comes with a certain amount of base memory. Increase the amount of memory to as much as you can afford.

SIMM/DIMM slots: You increase memory by adding small cards in dedicated slots. Apple has now rejected SIMM memory cards for faster DIMM cards. Note: Your old SIMMs won't work in the new DIMM slots. More slots means more flexibility.

Storage: You store applications and documents on your Mac's hard drive. Buy as large a hard disk as possible – you'll be amazed how fast it fills up. Most Macs have a bay for an optional internal CD drive.

Pricing: The (ex-VAT) prices for Apple machines printed here are set by the company as "expected street prices". In reality, street prices are much lower – between 20 per cent and 30 per cent in many cases.

Just take a look at the prices quoted in *Macworld*'s ad pages. Shop around for the best all-round deal.

PERFORMA 6200

Processor: PowerPC 603
Speed: 75MHz
FPU: Yes
Expansion: LC PDS
Memory: 8MB to 64MB
SIMM Slots: 2
Includes: ClarisWorks, PC Exchange
Pricing: £1,275: 8MB RAM, 500MB hard disk, CD drive, 15" colour monitor; **£1,415:** 8MB RAM, 500MB hard disk, CD drive, TV Tuner, 15" colour monitor; **£1,460:** 8MB RAM, 800MB hard disk, CD drive, modem, 15" colour monitor.

PERFORMA 5200/5300

Processor: PowerPC 603
Speed: (5200) 75MHz; (5300) 100MHz
FPU: Yes
Expansion: LC PDS
Memory: 8MB to 64MB
SIMM Slots: 2
Includes: Built-in 15-inch colour monitor, ClarisWorks, PC Exchange. 5300 inc CDs and eWorld
Pricing: (5200 Plus) **£1,365:** 8MB RAM, 800MB hard disk, CD-ROM drive. **£1,595:** 8MB RAM, 800MB hard disk, CD-ROM drive, TV Tuner, modem. (5300) **£2,145:** 16MB RAM, 1.2GB hard disk, CD-ROM drive, TV Tuner, modem, MPEG.

(5200 Plus) ★★★/5.6 **The all-in-one design is appealing, but the performance is just so-so**
Mar 96

POWER MAC 7200/75
POWER MAC 7200/90

Processor: PowerPC 601
Speed: 75MHz or 90MHz
FPU: Yes
Expansion: 3 PCI slots
Memory: 8MB to 768MB
DIMM Slots: 4
Includes: 1GB or 2GB hard disk
Requires: Monitor, keyboard
Pricing: (7200/75) **£1,005,** 8MB RAM, 500MB hard disk; (7200/90) **£1,385,** 8MB RAM, 500MB hard disk, CD drive; **£1,830,** 16MB RAM, 1GB hard disk, CD drive

(7200/75) ★★★/6.8 **A dumbed-down version of the 7500, this system offers just the basics**
Mar 96

POWER MAC 8500/120

Processor: PowerPC 604
Speed: 120MHz
FPU: Yes
Expansion: 3 PCI slots
Memory: 8MB to 512MB
DIMM Slots: 8
Requires: Monitor, keyboard
Pricing: £3,600, 16MB RAM, 2GB hard disk, CD drive

★★★★/7.7 **The 8500's 604 CPU and bundled cache give it good performance**
Mar 96

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POWER MAC 7500/100

Processor: PowerPC 601
Speed: 100MHz
FPU: Yes
Expansion: 3 PCI slots
Memory: 8MB to 512MB
DIMM Slots: 8
Requires: Monitor, keyboard
Pricing: £1,825, 8MB RAM, 500MB hard disk, CD drive; **£2,299,** 100MHz, 16MB RAM, 1GB hard disk, CD drive;

★★★★/7.8 **Powerful and relatively inexpensive, the Power Mac 7500/100 shines in its easy-to-upgrade design**
Mar 96

POWER MAC 9500/132

Processor: PowerPC 604
Speed: 132MHz
FPU: Yes
Expansion: 6 PCI slots
Memory: 16MB to 768MB
DIMM Slots: 12
Requires: Monitor, keyboard
Pricing: £3,665, 16MB RAM, 2GB disk, CD drive; **£3,880,** 16MB RAM, 2GB disk, CD drive, ATI Video

★★★ **Power Mac offers speed, expansion and lots of memory**
Oct 95

POWERCURVE 601/120

Manufacturer: Power Computing
Processor: PowerPC 601
Speed: 120MHz
FPU: Yes
Expansion: 3 PCI slots
Memory: 8MB to 256MB
DIMM Slots: 4
Requires: Monitor
Pricing: £1,699,
8MB RAM, 850MB hard disk, CD drive

POWERWAVE 604/120 POWERWAVE 604/132 POWERWAVE 604/150

Manufacturer: Power Computing
Processor: PowerPC 604
Speeds: 120MHz, 132MHz, and 150MHz models
FPU: Yes
Expansion: 3 PCI slots
Memory: 16MB to 512MB
DIMM Slots: 8
Requires: Monitor
Pricing: (604/120) **£2,495**, (604/132) **£2,999**, inc 256K cache; (604/150) **£3,499**, inc 512K cache; *each system:* 16MB RAM, 1GB hard drive, CD and Zip drives

(604/120) ★★★★/7.6 **Power Computing has made the 604 CPU available at 601-based systems' prices**
Feb 96
(604/132) ★★★★/7.6 **This fast system bundled with bonus software is great value**
Feb 96
(604/150) ★★★★/7.7 **The fastest Mac currently available, though the price is not as attractive as the other PowerWave models**
Feb 96

SUPERMAC STORMSURGE 150

Manufacturer: Umax Computer Corporation
Processor: PowerPC 604
Speeds: 150MHz models
FPU: Yes
Expansion: 6 PCI slots
Memory: 16MB to 1GB
DIMM Slots: 8
Pricing: to be announced

POWERBOOK 190 POWERBOOK 190cs

Processor: 68LC040
Speed: 66/33MHz
Memory: 4MB to 40MB
Screen: (190) 9.5-inch passive matrix, 16 levels of grey (190cs) 10.4-inch passive matrix, 256 colours
Pricing: (190) **£995:** 4MB RAM, 500MB hard disk; **£1,220:** 8MB RAM, 500MB hard disk; (190cs) **£1,355:** 4MB RAM, 500MB hard disk; **£1,585:** 8MB RAM, 500MB hard disk

POWERBOOK 5300 POWERBOOK 5300cs

Processor: PowerPC 603e
Speed: 100MHz
Memory: 8MB to 64MB
Screen: (5300) 9.5-inch passive matrix, 16 levels of grey (5300cs) 10.4-inch passive matrix, 256 colours
Pricing: (5300) **£1,531:** 8MB RAM, 500MB hard disk; (5300cs) **£1,931:** 8MB RAM, 500MB hard disk; **£2,418:** 16MB RAM, 750MB hard disk

(5300) ★★★/5.8 **A greyscale screen and middling performance make this just an acceptable notebook**
Mar 96
(5300cs) ★★★/5.9 **Good expansion, so-so speed, and a decent colour screen make this fine for short-term use**
Mar 96

POWERBOOK 5300c POWERBOOK 5300ce

Processor: PowerPC 603e
Speed: 117MHz
Memory: 8MB to 64MB
Screen: (5300c) 10.4-inch active matrix, up to 16-bit colour (5300ce) 10.4-inch SVGA active matrix, 16-bit colour
Pricing: (5300c) **£2,552:** 8MB RAM, 500MB hard disk; **£3,108:** 16MB RAM, 750MB hard disk; (5300ce) **£4,785:** 32MB RAM, 1.1GB hard disk

(5300c) ★★★/5.9 **A great colour screen and strong expandability balance with so-so performance**
Feb 96

POWERBOOK DUO 2300c

Processor: PowerPC 603e
Speed: 100MHz
Memory: 8MB to 56MB
Screen: 9.5-inch active matrix, up to 16-bit colour
Pricing: £2,530: 8MB RAM, 750MB hard disk; **£3,300:** 20MB RAM, 1.1GB disk; Express modem II

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Macworld's star ratings lets you compare Macintosh products by providing summaries of *Macworld*'s authoritative product reviews from the past year. Since February 1996, each product has received a numeric score that provides a more exact assessment of the product's quality within that level. We evaluate seven factors to derive the star rating: feature set, design implementation, performance, reliability, ease of use, innovation, and value. We take these evaluations, weight their importance for each class of product, and calculate the final score. The higher the score, the better a product is, even among products with the same number of stars. The following list shows how the ratings and scores relate.

JENNIFER JESSEE

★★★★★	9.0 to 10.0	Outstanding
★★★★	7.0 to 8.9	Very Good
★★★	5.0 to 6.9	Good
★★	3.0 to 4.9	Flawed
★	0.0 to 2.9	Unacceptable

Note that prices are true as when reviewed – and may have changed since.

MW LAB

An MW Lab logo indicates a **Macworld Editors' Choice** award. Refer to the relevant issue for full product listing, benchmarks and test results. For a copy of each MW Lab feature report, use the *Macworld Faxback* service – see Contents for details.

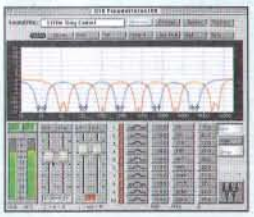
If a product has been upgraded since our last review, the most recent version number supplied by the vendor appears in parentheses after the reviewed version number. To read a full review of any listed product, please consult the issue listed at the end of each synopsis. For back copies, ring Kelly Stemp on 0171 831 9252

Vendors: Please write to Macworld Update, 99 Gray's Inn Road, London, WC1X 8UT to inform us of changes in the version number or list price of your product, or of changes to your phone number.

MW LAB

AUDIO/MUSIC

see also Multimedia



DIGITAL RECORDING AND EDITING, ***Dec 95***

Tools for professional desktop sound, hardware and software

SOFTWARE-ONLY: **Deck II**; OSC @ Natural Audio, 0181 207 1717; £399. This program can handle professional-level multitrack recording and video soundtrack post-production. It also supports Digidesign hardware.

LOW END: **Audiomedia II**; Digidesign, 0171 494 2949; £899. This NuBus card provides digital I/O and a gateway to the universe of Digidesign-compatible plug-ins. It includes the first-rate Sound Designer II software.

HIGH END: **Pro Tools III Core System**; Digidesign, 0171 494 2949; £5,199 (excluding required interface). With the ability to insert plug-ins as though they were external effects boxes, Pro Tools III takes the concept of non-destructive editing to its limits.

MULTIMEDIA SPEAKERS, ***Mar 96***

Hardware stereo sound winners

DESKTOP: **MediaMate**; Bose, *01795 475 341*; £250. Top-notch sound gets top honours. ★★★★/7.8

THREE-PIECE: **Acoustimass**; Bose, *01795 475 341*; £750. Sound comparable to a standard stereo system. ★★★★/7.9

★★★★ **FreeStyle 1.01**, Mark of the Unicorn @ Klemm Technology, *01462 733 310*, £149. Music sequencer organizes MIDI instruments into players, a metaphor that's easier to understand than traditional tracks and patches. It could use a lyric tool. ***Dec 95***

★★/3.5 **Labtec LCS-3210**, Labtec, *01252 890 585*, £120. These loudspeakers are decent, but midrange is unimpressive and 3D sound feature is poorly implemented. ***Dec 95***

★★★★ **Nightingale 2.0**, Tap Music @ Capedia, *01603 259 900*, £219. Easy-to-learn, powerful music-notation software. ***Dec 95***

★★★★ **Overture 1.02**, Opcode Systems @ MCMXCIX, *0171 723 7221*, £349. Easy-to-learn, midrange notation software has a friendly interface and shows real polish. If you don't need all the features of a high-end product, it's a serious contender. ***Apr 95***

★★★★ **Practica Musica 3.0** (3.1), Ars Nova Software @ MacLine, *0181 401 1111*, £75. Smart, patient personal music coach.

★★★ **SoundEdit 16** (2.0), Macromedia @ CU, *0181 200 8282*, £349. Digital audio software supports 16-bit sound and has enough goodies to earn it a place in a multimedia producer's toolbox. ***Dec 94***

★★★ **Vision 2.08**, Opcode Systems @ MCMXCIX, *0171 723 7221*, £449. MIDI program's list of exclusive, creativity-slanted features, such as endless count off and scrubbing (which lets you hear the music as you drag across it), give the program a usability edge.

★★ **Visual Arranger 1.0**, Yamaha-Kemble, *01908 366 700*, £36. Icons represent musical styles in this song-building program. It's fun, but the icons can be cumbersome, and the program lacks features required by professional musicians. ***Dec 95***

★★★ **Vivid 3D Pro**, NuReality @ LMP, *01992 503 133*, £149. This sound-enhancement system uses the SRS technique to produce 3D sound from a pair of speakers. While it's great for system sounds and games, it's less impressive for audio CDs. ***Aug 95***

★★★/6.4 **YST-SS1010**, Yamaha, *01908 366 700*, £168 . This satellite-and-subwoofer speaker system (above) is highly recommended, despite its mediocre manual. ***Jul 95/Mar 96***

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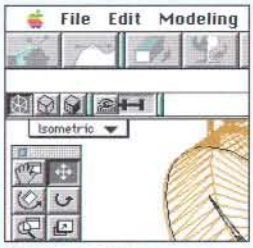
BUSINESS TOOLS



INTEGRATED SOFTWARE, *NOV 95*
What counts for integrated software is a deep feature set that doesn't compromise ease of use
ClarisWorks 4.0;Claris, *0181 756 0101*; £99
To ease-of-use and depth of features, ClarisWorks adds integration, clean design and speed. If you're ever marooned on a desert island with your PowerBook and one program, just hope that program is ClarisWorks.

PORTABLE PRESENTERS, *Jan 95*
MW Lab tests LCD panels and projectors
Z115; nView, *01293 524 544*; £4,695
Elegantly designed and offering crisp display quality, the Z115 (right) weighs less than 10 pounds.

★★★★/8.8 **4th Dimension 3.5**, ACI, *01625 536 178*, £795. The leading Mac relational database is a good choice for mixed platform, medium-scale client/server applications. ***Mar 96***.

★★★ **ACT 2.0**, Symantec Corp @ Principal, *01706 832 000*, £169. Contact manager's file-level compatibility with DOS and Windows and its complete contact management make it worth considering if you can live with its weak scheduling functions.

★★ **Adobe Acrobat 2.0**, Adobe Systems, 0800 232 223, £195. The font fidelity of this portable-document software is uneven, and the software demands too much in resources compared with other options. ***Mar 95***

★★★ **Adobe Acrobat 2.0**, Adobe Systems, 0800 232 223, £160 single user, £1,300 workgroup edition. As a collaboration tool, this software is inexpensive and offers well-done annotation tools. However, it's resource-intensive and not always easy. ***Mar 95***

★★★★ **ArcView 2.1**, Environmental Systems, *01923 210 450*, £1,095. Intuitive software lets you visualize and analyze data in the context of maps. Requires a lot of memory. ***Jan 96***

★★★★/7.1 **Astound 2.0**, Gold Disk @ Frontline, *01256 841 841*, £189. Fully fledged multimedia-authoring tool that makes simple work of producing memorable presentations. ***Mar 96***.

★★★ **CA-Cricket Graph III 1.52 (1.53)**, Computer Associates @ Frontline, *01256 841 841*, and Principal, *01706 832 000*, £145. Graphing software's features are just right for charts in the physical and social sciences, but they lack pizzazz. ***Dec 94***

★★★★/8.0 **Claris Impact 2.0**, Claris, *0181 756 0101*, £92. Easy and affordable business graphics. ***Feb 96***

★★★ **Claris Organizer 1.0** (1.0v2), Claris, *0181 756 0101*, £49. New personal information manager users, lured by the price, performance, and ease of use of this product, will find that it meets their needs. Most longtime PIM users won't be tempted to switch. ***Jan 95***

★★★★ **ClarisWorks 4.0**, Claris, *0181 756 0101*, £129. Dozens of delicate nips and tucks characterize the latest upgrade of this integrated program. Its word processor and database components stand up to their standalone counterparts. ***Oct 95***

★★/3.7 **Day-Timer Organizer 2.0**, Day-Timer, *0800 716 134*, £50. Eclectic mix of novel features and annoying quirks. ***Mar 96***

★★★ **Day-to-Day Organizer 1.0**, Portfolio Software @ MacLine, *0181 401 1111*, £39. The address-book and outlining components of this organizer are great, but overall it's a mixed bag. The calendar interface needs to be improved.

★★★★★ **DeltaGraph Pro 3.5**, DeltaPoint Software @ Frontline, *01256 841 841*, £139. Easy-to-use graphing software stands out from the pack. ***Jan 96***

★★★ **Expresso 1.0**, Berkeley Systems @ Softline, *0181 401 1234*, £25. The just-the-basics approach of this calendar and address book might be just fine for people who don't need the feature set of other calendar programs and enjoy its graphics. ***Apr 95***

★★★ **FastTrack Schedule 3.0**, AEC Software @ Viatec, *01276 684 506*, £199. Updated version of this project planner includes a detailed calendar, customizable Gantt chart, and new formatting columns. ***Aug 95***

★★★★ **Helix Express 3.03**, Helix Technologies, *01642 47201*, £400. Latest release of this visually-oriented database adds speed and features – including conditional branching capabilities, and improved forms-drawing tools – without raising RAM requirements. ***Sep 95***

★★★ **In Control for Workgroups 3.5**, Attain @ Principal, *01706 832 000*, £69; 10-pack £823. Flexible project planner and scheduler combines an outliner and a calendar. It's a valuable tool for networked groups that need to share project information. ***Sep 95***

★★★ **InfoGenie 1.0.5**, Casady & Greene @ Softline, *0181 401 1234*, £55. Data manager supports both free-form and field-based files, but list-view functions are limited. ***Jan 96***

★★★ **InTouch 2.5**, Prairie Group @ MacWarehouse, *0800 181 332*, £39. Free-form contact manager offers speedy access to information. If you don't need to perform complex searches or sorts, this program is a good choice. ***Sep 95***

★★★★ **MapInfo 3.0**, MapInfo, *01344 482 888*, £1,095. Versatile mapping program lets you geocode the geographical data in a database, conduct spatial analyses, and create presentation graphics. ***Oct 95***

★★★★ **MarcoPolo 3.0**, Mainstay @ Computers Unlimited, *0181 200 8282*, £359. Full-featured document-management system is significantly improved. The addition of OCR makes it very usable. ***Jan 95***

★★★★ **Microsoft Excel 5.0**, Microsoft Corp., *01734 270 000*, £260. Although the feature set of this Power Mac spreadsheet is stunningly rich, the system requirements for a full install are jaw-dropping. ***Jan 95***

★★★ **Microsoft PowerPoint 4.0**, Microsoft Corp., *01734 270 000*, £245. If you're in the market for a presentation-graphics program, this is a good choice to use along with Word or Excel, as long as you don't mind the lack of animation functions. ***Feb 95***

★★★ **Microsoft Works 4.0**, Microsoft Corp., *01734 270 000*, £120. Sensible, low-cost Integrated package offers respectable word processor, database, spreadsheet, and calendar/address book, plus a slide-show module, and drawing and communications tools. ***Jan 95***

★★★★ **Now Up-to-Date and Contact 3.5**, Now Software, *01525 237 100*, £69 each, £99 for both. New features such as an improved to-do list and a linked notepad make this the premier address-book and calendar program. ***Nov 95***

★★★ **Phyla 1.0.3**, Mainstay @ MacWarehouse, *0800 181 332*, £69.95. While non-programmers can learn to use this object-oriented database, a little SmallTalk or C++ programming background wouldn't hurt. ***Aug 95***

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MW LAB — CD-ROM/REWRITABLE

QUAD-SPEED CD-ROM DRIVES, *Jun 95*
MW Lab tests to determine if performance matches price
D2 4xCD; D2 Electronique, *01256 331 111*; £319
This quad-speed drive is good value, and includes SCSI and stereo audio cables.

CD-R PUBLISHING, *Mar 95*
MW Lab gives you the lowdown on publishing your own CDs

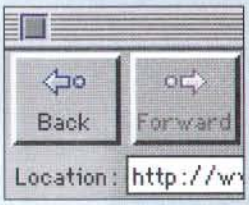
★★★ **Master CD Pro**, MicroNet Technology, *01203 537 024*, £2,699. With support for multiple formats, this quad-speed, multisession, recordable CD-ROM drive is a good tool for professional CD production. It ain't cheap, though. ***Aug 95***

★★ **RCD-1000**, Pinnacle Micro @ UK Flex, *0121 624 7777*, £1,429. Too unreliable as a day-to-day backup system. ***Jun 95***

★★★★ **Reno Portable CD-ROM Player**, MediaVision, *01494 465 050*, £299. Lightweight, versatile, and easy to set up. ***Jun 95***

MW LAB — COMMUNICATIONS & INTERNET

see also Modems



LET'S GO SURFIN' NOW, *May 95*
Beginner's guide to the Internet

GUIDES TO AMAZE, *Oct 95*
Testing the tools for browsing the World Wide Web
Netscape Navigator 1.1 (2.0); Netscape Communications, 001 415 528 2555, Free ($39 registration for manual)
The only browser to pass all the tests without crashing, Navigator is inexpensive, easy to use, and offers full firewall security and a host of other features.

NO PLACE LIKE HOME, *Nov 95*
Build your own Web home page

YOU PAYS YOUR MONEY, *Jan 96*
Choosing an Internet Service provider

BAND (NOT) ON THE RUN, *Feb 96*
Tips on bandwidth woes

CALM BEFORE THE STORM, *Mar 96*
Protocol fragmentation

★★★ **Claris Emailer 1.0**, Claris, *0181 756 0101*, £55. Offers an impressive suite of e-mail features at a good price, and its ability to deal with multiple mail services is unique. Some rough edges, but eminently usable. ***Dec 95***

★★/4.9 **CyberFinder**, Aladdin Systems @ Softline, *0181 401 1234*, £35. Integrates the Internet right into the MacOS via the Finder, but no real search function means shareware is better option. ***Mar 96***.

★★★/6.9 **HoTMetal Pro 2.0**, SoftQuad @ UIT, *01223 302 041*, £169. Fine tuning and wide support, but impenetrable web-page creator for beginners. ***Feb 96***.

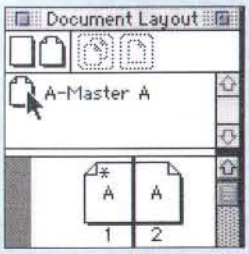
★★★★ ***Internet Explorer Kit and Internet Starter Kit***, Hayden Books @ IBD, *01442 881 900*, £27.50. Well-written books and useful software combine to produce one of the best introductions to the Internet available for Mac users. ***Jan 95***

★★★★ **Netscape Navigator 1.1** (2.0), Netscape Communications Corporation, *001 415 528 2555*, Free ($39 registration for manual). World Wide Web browser is well ahead of the competition in terms of features, stability, and ease of use. ***May 95***

★★★★/8.5 **PageMill 1.0**, Adobe, *0800 232 223*, £90. Easy-to-use web-page creator is ideal for beginners. ***Feb 96***.

★★★ **SnapMail 2**, Casady & Greene @ Softline, *0181 401 1234*, £159 (5 users), £249 (10 users), £995 (50 users). Easy setup, simple admin, and a slew of new features make this an attractive e-mail package. Gateway interface needs improving. ***Dec 95***

MW LAB — DESKTOP PUBLISHING



ELECTRONIC PUBLISHING, *DEC 95*
Macworld looks at desktop publishing beyond paper
CDs and the World Wide Web

EXTRA! EXTRA, *Sep 95*
Top utilities and add-ons for XPress and PageMaker
XTensions and plug-ins

THE PUBLISHING FACE-OFF, *Jan 96*
Does the Macintosh still reign supreme in DTP?
Desktop publishing has long been the cornerstone of Macintosh superiority. Is the Mac still the reigning king of DTP, or is it time to hand the crown over to Windows 95?
See *Macworld*'s special report in this issue.

EXPERT PUBLISHING, *Feb 96*
Get to grips with resolution

Macworld star ratings • Macworld star ratings • Macworld star ratings • Macworld star ratings

★★★★ **Adobe PageMaker 6.0**, Adobe Systems, *0181 606 4000*, £515 (upgrade £100). Page-layout pioneer has been discreetly but thoroughly overhauled. More than 50 new features deliver high-powered layout, typographic, and colour capabilities. ***Nov 95***

★★★★ **Beyond Press 1.0**, Astrobyte @ XChange, *0171 637 2966*, £485. Fast and simple, if expensive, conversion from QuarkXPress to HTML that automatically converts graphics to GIF and JPEG formats. ***Dec 95***

★★★ **ColorDrive 1.0**, Pantone @ MacWarehouse, *0800 181 332*, £119. Centralized colour-management software supports a broad range of colour models, but accuracy isn't consistent. ***Nov 95***

★★★★ **FrameMaker 5.0**, Frame Technology, *0181 606 4100*, £695. Despite a quirky interface, this is still the page-layout program of choice for complex technical documents, especially if they include multipage tables. ***Nov 95***

★★★ **Pianzhang**, Miles 33, *01344 861 133*, £895. Comprehensive, but expensive and memory hungry, automation of repetitive, text-heavy layouts. ***May 95***.

★★★★ **theTypeBook 4.0**, Rascal Software @ Part Fono 547, *0800 181 332*, £29.95. The manual needs work, but this type-specimen generator provides enough customization options to make it a worthwhile purchase. ***Jun 95***

★★★★ **QuarkXPress 3.3.1**, Quark @ Computers Unlimited, *0181 200 8282*, £995. The long-awaited native Power Macintosh version of XPress offers users a number of performance improvements. ***Jan 95***

★★★★/7.2 **QX-Tools 1.0**, Extensis @ Principal, *01706 832 000*, £109. Ten XTensions to make XPress more powerful. ***Feb 96***.

MW LAB

DIGITAL CAMERAS

PROFESSIONAL REAL-TIME FILMLESS CAMERAS, *OCT 95*

Fujix DS-515/Nikon E2; Fuji, *0171 586 5900*; Nikon, 0181 541 4440; £11,360. (Identical cameras) Though complicated to use, this camera's superb image quality and impressive controls set it apart from the competition.

★★★★ **DS-505/515**, Fuji, *0171 586 5900*; Nikon, *0181 541 4440*, from £9,040. Excellent image and colour quality, proper lens field of view and good controls, but limited apertures. ***Oct 95***

★★★ **Digital Camera 40**, Kodak, *01442 61122*, £895. Digital camera can use 37mm lens but has some flaws. ***Jan 96***

★★★★ **FlexCam**, VideoLabs @ Hanimex, *01793 526 211*, £599. Small, unobtrusive desktop video camera has a flexible gooseneck for positioning. ***Dec 94***

★★★★ **QuickCam**, Connectix Corp.@ Computers Unlimited, *0181 200 8282*, £140. For as little as £75 (street price), this tiny, fun, easy-to-use, digital video camera lets users experiment with video input. ***Mar 95***

★★★ **QuickTake 150**, Apple, *0800 127 753*, £350. Digital camera is easy to use and includes close-up lens. ***Jan 96***

MW LAB

DISPLAY

MONITORS

(17") **17B**; Philips Consumer Electronics, *0181 689 4444*; £849. ***Oct 95***

Its bright, clear, richly coloured picture is complemented by simple, well-designed controls. It was the big winner in our subjective tests.

(Two-page) **RasterOps Sperscan Mc 21**; NSA/Hitachi @ Aptec, *0171 627 1000*; £1,475. ***Feb 96***

Took top honours in every important performance category and won kudos for its sensible, intuitive controls.

DIGITAL-VIDEO BOARDS, *AUG 95*

SpigotPower AV; Radius @ Computers Unlimited, *0181 200 8282*; £999

Attach this board to an AV Mac's DAV slot and you can record, edit, and play back 640x480-pixel, 30fps, interlaced video. Dropped frames are a problem, but this board handles any job short of broadcast-quality video.

★★★★ **Colortron**, Light Source @ CU, *0181 200 8282*, £899. Getting the colours on your screen to match those in your output is now easy and affordable, thanks to this spectrophotometer, which measures transmissive and reflective sources. ***Jun 95***

★★/4.6 **FlexScan F2 21**, Eizo @ Professional Display, *01483 757 118*, £1, 519. Blurry, dim image, and expensive. ***Feb 96***.

★★★/5.3 **VisionMaster Pro 21**, Iiyama, *01438 745 482*, £1,399. Good image quality, but confusing controls. ***Feb 96***.

★★★/5.8 **Diamond Pro 21TX**, Mitsubishi, *01707 278 611*, £1,675. Washed out colours hold backotherwise strong contender. ***Feb 96***.

★★/4.8 **Multigraph 445X**, Nokia @ Datech, *0181 308 1800*, £1,649. Average image quality. ***Feb 96***.

★★★/6.5 **Multiple Scan 20**, Apple, *01800 127 753*, £1,350. Not as vibrant as it could be, but good value. ***Feb 96***.

★★★★/7.2 **MultiSync XE21**, NEC @ Datech, *0181 308 1800*, £2,199. Rich, bright images complemented by excellent controls. ***Feb 96***.

★★★/5.8 **MultiView 21**, Radius @ CU, *0181 200 8282*, £1,749. MSeductively rich colours, but too soft a focus. ***Feb 96***.

★★★★/8.6 **PressView 21 SR**, Radius @ CU, *0181 200 8282*, £3,559. The best professional-quality display gets better. ***Feb 96***.

★★/4.1 **SyncMaster 20GLs**, Samsung @ Axicom, *0181 941 8898*, £999. Glare-catching, image-distorting tube and weak controls. ***Feb 96***.

★★★/5.8 **ViewSonic 21PS**, ViewSonic @ Ambar, *01296 435 511*, £1,459. Bright, vibrant, though not particularly sharp image. ***Feb 96***.

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MW LAB

EDUCATION/ENTERTAINMENT

MACWORLD GAMES HALL OF FAME, *Jan 96*
Our favourite games of the year
ROLE-PLAYING: **Re-elect JFK**;Quadra @ Gem, *01297 822 800*, £34.99
Classy graphics – mixed with the greatest mystery story of our century.
SHOOT 'EM UP: **PegLeg**; Changeling @ Softline, *0181 401 1234*, £29.99
Take a lot of weird-looking aliens – and blast them to pieces
ARCADE: **Power Pete**; MacPlay @ Softline, *0181 401 1234*, £34.99
A dark and desperate quest – to save innocent, fuzzy bunnies.
MULTIMEDIA: **Dust**; CyberFlix @ BMG, *0171 384 7774*, £39.99
Slickly programmed horse opera, in the Hollywood tradition.
ADVENTURE: **Dark Forces**; LucasArts Entertainment @ Virgin Interactive, *0171 368 2255*, £49.99
Terrific 3D graphics and complex scenarios in this Star Wars game
NETWORK: **Marathon**; Bungie Software @ Softline, *0181 401 1234*, £58.74
Forget Doom – this is *the* hot game among 3D space-dungeon snarfers
SIMULATION: **Maxis**; *0171 490 2333*, £39.99
Never has a game made a user feel more godlike.
BRAIN GAME: **Strategic Leap**; MacSoft @ One Stop, *01268 419 101*, £29.99
Injects some hip-hop and mystery into draughts.
STRATEGY: **Warlords II**; Strategic Studies @ Electronic Arts, *01753 549 442*, £39.99
Splendid graphics with this Middle Earth-like empire-builder.
FLIGHT SIMULATOR: **A-10 Attack**; Parsoft International @ Softline, *0181 401 1234*, £58.74
Stunningly realistic sorties into enemy territory in an A-10A Thunderbolt II – smart bombs and all.

★★★★ **3D Atlas 1.1**, EA World, *01753 549 442*, £59. Atlas enriches data with narration, photos, and movies. ***May 95***

★★★★ **The Daedalus Encounter**, Virgin, *0181 960 2255*, £44,95. You've been blown to smithereens and your brain has been stuffed inside a robot. Don't you hate it when that happens? Escape from a doomed spacecraft in this interactive adventure. ***Sep 95***

★★★ **FrenchNow 3.0**, Transparent Language @ Interactive Ideas, *0181 447 9288*, £77. Language-learning tool supports 8- and 16-bit audio, but some effects have limited usefulness. ***Dec 95***

★★★★ **Full Throttle**, Lucas Arts @ Virgin, *0171 368 2255*, £45. Wittily written, wonderfully cinematic – though puzzles not that difficult and graphics somewhat blocky. ***Jan 96***

★★★★ **The Lost Mind of Dr. Brain**, Sierra On-Line, *01734 303 322*, £39.99. A wise-guy rodent tries to trip you up as you solve a series of hilarious and challenging brainteasers. ***Oct 95***

★★★★/8.5 **Marathon 2**, Bungie Software @ Softline, *0181 401 1234*, £55. Fast, fluid adventure not for squeamish. ***Mar 96***

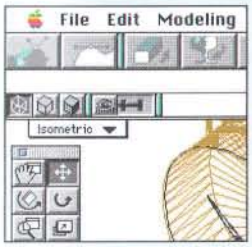
★★★ **Out of the Sun**, Domark @ Softline, *0181 401 1234*, £29.99. Historic flight-simulation game. ***Jan 96***

★★★ **Small Blue Planet 2.0** (2.0.1), Now What? Software @ Softline, *0181 401 1234*, £49. The satellite photos of this atlas are truly dazzling, although the interface is less than world class. ***May 95***

★★★★ **Storybook Weaver Deluxe 1.0**, MECC @ Iona Software, *0181 241 8925*, £19.99. Lets kids combine pictures, sounds, and words to make their own storybooks. ***May 95***

MW LAB

GRAPHICS/DESIGN/CAD



3D MODELLING, *DEC 94*
MW Lab picks the right 3D modeller for power and price
STANDALONE MODELLER: **formZ**; autodessys @ Gomark, *0171 731 7930*; £1,214
The only Macintosh package capable of true solids modelling, FormZ also has an extensive tool set that merits the extra learning effort.
INTEGRATED PACKAGE: **StudioPro**; Strata @ Gomark, *0171 731 7930*; £1,067
This all-in-one package offers an excellent combination of modelling, rendering and animation features for the price.
ENTRY-LEVEL MODELLER: **Infini-D**; Specular @ Gomark, *0171 731 7930*; £531
This appealing program provides a good balance of modelling, rendering and animation capabilities along with an interface that eases the transition from two dimensions to three.

IMAGE EDITORS, *FEB 95*
Which image editor satisfies your needs?
Adobe Photoshop 3.0; Adobe Systems, *0181 547 1900*; £725
Although it lacks proxies and continues to perform sluggishly compared with Live Picture and others, Photoshop provides a wealth of capabilities the others don't even touch.

NATURALISTIC DRAW PROGRAMS, *MAR 96*
New generation intuitive, low-cost drawing
SmartSketch 1.0; FutureWave Software @ CSG, *0181 679 7307*; £45
If you can drag a paintbrush across a screen, you can use SmartSketch. Even for professionals, this program is an ideal sketching tool, supplying all of the immediacy of Illustrator's pen tool lacks.
KPT Vector Effects; MetaTools @ Principal, *01706 832 000*; £129
This collection of Illustrator- and FreeHand- compatible plug-ins contains filters both obvious in purpose and easy to apply.

★★★ **AddDepth 2.0**, Ray Dream @ Principal, *01706 832 000*, £108. If your text and graphics are looking a little flat, you can extrude them with this 3D effects program. New routines automate the design process, but drawing tools are still limited.

★★★★ **Adobe Dimensions 2.0**, Adobe Systems, *0800 232 223*, £99. 3D effects software has added colour support, as well as

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drawing and text tools. Its ability to create resolution-independent 3D images and map 2D art earns it a place on a designer's hard drive.

★★★★ **Adobe Photoshop 3.0**, Adobe Systems, *0800 232 223*, £628. Image-editing program both broadens its capabilities and simplifies its work environment in this dynamic upgrade. While it's not perfect, the pros far outweigh the cons.

★★★ **Adobe TextureMaker 1.0** (2.0), Adobe Systems, *0800 232 223*, £115. Versatile program lets you layer effects to create custom textures. The textures are impressive, but the program's a bit pricey.

★★★ **Alien Skin Textureshop 1.0**, Virtus @ Gomark, *0171 731 7930*, £99. Apply mutations to master textures to create custom patterns made up of seamless tiles. A simple way to create patterns. ***Jul 95***

★★★ **Black Box 2.0**, Alien Skin @ Principal, *01706 832 000*, £79. Photoshop image filters are worth their modest price. ***Jan 96***

★★★★ **Blueprint 5.0**, Graphsoft @ Gomark, *0171 731 7930*, £210. For plain old 2D drafting, this fast CAD software has a rich, easy-to-use feature set. The Power Mac version is a first choice for large architectural or engineering diagrams. ***Jan 95***

★★★ **CD-Q 2.0**, Human Software Company @ CGS Computerbuild, *0181 679 7307*, £109. Take advantage of Kodak's YCC format for Photo CD with this Photoshop plug-in, which lets you make colour corrections and fine-tune colour separations. ***Jul 95***

★★★ **ClarisDraw 1.0** (1.0v2), Claris, 0181 756 0101, £129. For presentations without grand artistic pretensions, this draw program can be an effective tool.

★★★ **Collage 2.0.1**, Specular @ Gomark, *0171 731 7930*, £270. Practical image-compositing solution supplies a smooth interface and strong Photoshop 3.0 support.

★★★★/7.5 **Dabbler 2**, Fractal Design @ CU, *0181 200 8282*, £75. Easy and affordable matural media-paint tools. ***Mar 96***

★★★★/7.3 **DrawTools 1.0**, Extensis @ Principal, *01706 832 000*, £109. Extensions add colour, shape, and object tools to FreeHand and Illustrator. ***Feb 96***.

★★/4.5 **Envelopes**, Letraset, *0171 928 3411*, £75. Vector-based drawing plug-in filter is a mediocre, one-trick pony. ***Mar 96***

★★ **FloorPlan Plus 1.1**, ComputerEasy @ FastCAD Europe, *01923 246 427*, £31.50. Simple, affordable CAD program is intended for rudimentary design tasks. It falls short in several areas; only 16 colours supported, for example, and no rulers. ***Sep 95***

★★★ **Fontographer 4.1**, Macromedia @ Computers Unlimited, *0181 200 8282*, £369. If you're interested in font design, or merely modifying your existing fonts for greater variety, Fontographer gets the job done. ***May 95***.

★★★★★/9.3 **Fractal Design Painter 4.0**, Fractal Design @ CU, *0181 200 8282*, £399. The best pure painting program, able to mimic practically any natural-media tool Painter has invented a software category all of its own. ***Mar 96***

★★★ **Gryphon Batch It 1.0**, Gryphon Software @ Softline, *0181 401 1234*, £140. Arranges tiles in a visual interface to automate repetitive graphics operations. Although it lacks conditional statements, this batch processor is a time-saver. ***Jun 95***

★★★★ **Infini-D 3.0**, Specular International @ Gomark, *0171 731 7930*, £599. 3D software does professional-quality rendering and animation. ***Jan 96***

★★★★/8.3 **Kai's Power Tools III**, MetaTools @ Principal, *01706 832 000*, £129. More powerful plug-ins. ***Feb 96***.

★★★★ **KPT Bryce 1.0** (1.0.1), MetaTools @ Principal, *01706 832 000*, £129. For just over a ton, you get a remarkable 3D-landscape rendering program, a CD of images, a slide-show utility, and some screen-saver modules.

★★★★ **KPT Convolver 1.0**, MetaTools @ Principal, *01706 832 000*, £129. Create your own Photoshop filters the intuitive way with this imaginative and absorbing plug-in module. The interface allows you to experiment. ***Aug 95***

★★★★/8.5 **KPT Vector Effects 1.0**, MetaTools @ Principal, *01706 832 000*, £129. Adobe Illustrator and Macromedia FreeHand users will enjoy this imaginative collection of 13 plug-in filters that warp, distort, and otherwise alter vector-based images. ***Mar 96***

★★★★ **Live Picture 2.0**, Live Picture @ Computers Unlimited, *0181 200 8282*, £799. Latest version of this innovative image editor boasts lower RAM requirements, faster operations, and a much lower price tag than the original. ***Sep 95***

★★★★★ **Macromedia FreeHand 5.5**, Macromedia, *01344 761 111*, £450. Faster and smarter version of this venerable drawing program has improved bitmap graphics support and better text features. Plus, tons of clip-art and a good selection of fonts. ***Dec 95***

★★★ **MaskCutter**, Scitex @ Principal, *01706 832 000*, £547. Suite of professional-level masking tools at a desktop price, but no erase or soft-edge tools. ***Aug 95***.

★★★★/8.1 **MiniCad 6**, Graphsoft @ Gomark, *0171 731 7930*, £595. Huge expansion in prefabricated-component convenience, plus a well-thought-out presentation format for its myriad new elements. ***Mar 96***.

★★★★ **Paint Alchemy 2.0**, Xaos Tools @ Principal, *01706 832 000*, £135. An interface lift, additional blending options, and improved animation controls make this flexible image editor an appealing add-on for digital artists. ***Sep 95***

★★★ **PhotoFix 2.8.8**, Microspot @ Linographic, *01252 376103*, £199. This image-editing/photo-enhancement program needs refinement, but its modest price and its ability to optimize images for output to low-end printers make it a useful tool.

★★★ **PhotoFlash 2.0**, Apple Computer, *0800 127 753*, £100. It's not a high-end image-editing program, but it does offer basic image-retouching tools at a reasonable price. ***Jul 95***

★★ **PhotoFusion 2.0.3**, Ultimatte @ Macline, *0181 401 1234*, £599. If your original shot is clean, this Photoshop masking plug-in does a good job. But in the real world, this program's poor manual and less-than-intuitive controls make it hard to use. ***Oct 95***

★★★★ **Poser 1.0**, Fractal Design @ CU, *0181 200 8282*, £149. Specialized graphics tool generates three-dimensional human figures. Its appealing interface is simple enough for beginners, while its powerful graphics capabilities are suitable for professionals. ***Aug 95***

★★★★ **PowerCADD 2.0**, Engineered Software @ PRD Creative, *01902 755 293*, £709. The latest incarnation of PowerDraw, PowerCADD is built for speed, but users will also take comfort in an enhanced interface and new drawing tools. ***Oct 95***

★★★ **Ray Dream Designer 3.1.1**, Ray Dream @ Principal, 01706 832 000, £275. 3D graphics program provides competent (if sometimes awkward) modelling tools, offers excellent surface-texturing capabilities, and produces high-quality ray-traced renderings.

★★ **SG Toolbox 1**, Scarlet Graphexx, 0181 781 1963, £35. Very basic Illustrator plug-ins. ***Aug 95***

★★★★ **SG Toolbox 2**, Scarlet Graphexx, 0181 781 1963, £65. Useful greyscale and multitone filters for Illustrator. ***Aug 95***

★★ **Select 1.6**, Human Software @ CGS Computerbuild, *0181 679 7303*, £175. Selection mode provides a convenient way to make changes to several colours at once,but all features of this CMYK colour-correction plug-in can be found in Photoshop. ***Jul 95***

★★★★/8.7 **SmartSketch 1.0**, FutureWave Software @ CGS Computerbuild, *0181 679 7303*, £45. Innovative, easy-to-use graphics program unites the free-form creativity of a paint program with the structure and precision of object-oriented drawing. ***Sep 95/Mar 96***

★★★★ **Transverter Pro 3.0**, TechPool Studios @ Business Presentations, *01462 743 090*, £387. Graphics-conversion tool lets you preview PostScript files or convert them to other formats. A must-have for publishing professionals. ***Dec 95***

★★★★/8.7 **UpFront 2.0.1**, SketchTech @ Gomark, *0171 731 7930*, £214. A compelling, useful addition to any architect's or modeller's tool box. ***Mar 96***

★★★ **Virtus WalkThrough Pro 2.0**, Virtus Corp. @ Roderick Manhatten, *0181 875 4400*, £295. Aside from occasional stumbles, this design tool is an exceptional program that lets you quickly and intuitively interact with your designs. ***Apr 95***

★★★★ **Vision 3d 4.0**, Strata @ Gomark, *0171 731 7930*, £480. 3D modelling, rendering, and animation package expands its array of modelling tools and adds two renderers. Plug-in extensions provide a practical way to customize the program. ***Jul 95***

★★★ **Working Model**, Visual Basic @ Random Computing, *0181 969 7702*, £1,495. Robust set of features. ***Dec 95***

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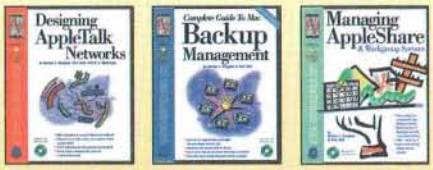

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★★ **xRes 1.11**, Fauve Software @ CSG Computerbuild, *0181 679 7307*, £799. You can apply a variety of effects to selected areas of a large composition with this image editor. Numerous interface oddities make it less attractive than the competition. ***Jul 95***

INPUT HARDWARE/DIGITIZERS/OCR SOFTWARE

ART TABLETS, ***DEC 95***
Two top digitizing tablets fight it out

★★★★★ **UltraPad A5**; Wacom @ Computers Unlimited, *0181 200 8282*; £329
Easy to use, with excellent pen-tilt sensitivity, extra button and eraser.

★★★★ **A5 Designer**; Quora @ TDS Graphics, *01254 676 921*; £250
Cheapest A5 tablet around with excellent pressure sensitivity, but awkward to set up.

★★★★ **DrawingSlate II**, CalComp @ DirekTek, *0181 845 5969*, £295. A responsive stylus and user-definable macros make this digitizing tablet an excellent choice for artists and illustrators. ***Jun 95***

★★★ **Desktop GlidePoint**, Alps Electric, *01604 763 611*, £75. Touchpad has adjustable base and cursor-release delay. ***Feb 96***

★★ **Jetstick**, CH Products @ Softline, *0181 401 1234*, £51. Our reviewer liked this joystick's hardware, but found the manual and the software lacking. ***Sep 95***

★★★ **Mouse-Trak**, Itac Systems @ NTWare, *01865 784 990*, £189. If you hate meeses to pieces, you might try this trackball input device. It's sturdy, but our reviewer found its side buttons too small. ***Nov 95***

★★★ **QuePoint II**, MicroQue @ Softline, *0181 401 1234*, £99. Excellent software makes it a clear winner. ***Feb 96***

★★★ **SoftBoard Model 205**, Microfield Graphics @ Mayflower Business Systems, *0171 267 0100*, £3,199. Easy-to-set-up electronic whiteboard that displays writing at remote sites – but expensive and requires special marking pens and erasers. ***Jan 96***

★★★ **TextBridge 3.0**, Xerox, *01734 668 421*, £99. Straightforward, effective and affordable OCR – but far from perfect with complex documents and small point text. ***Dec 95***

★★★★ **Thinking Mouse Macintosh ADB**, Kensington @ MacAccessory Centre, *0191 295 0353*, £115. Four buttons. ***May 95***

MATHS/SCIENCE

★★★★★/9.7 **Data Desk 5.0**, Data Description @ Majih Software, *00 353 1 671 9408*, £400. For exploratory data analysis and interactive statistical graphics, this great program is still the leader. ***Mar 96***.

★★★★ **LabView 3.1**, National Instruments, *01635 523 545*, £1,637. With improved graphing and printing features, Power Mac optimization, and links to HiQ, this instrument-emulation software is a must for Macintosh-based laboratories. ***Nov 95***

★★★★ **MathsPlus 2.0**, Waterloo Maple Software @ Robinson Marshall, *01203 233 216*, £199. Fast, palette-based maths software with a great assortment of features for students. ***Jun 95***

MW LAB

MODEMS

FAST MODEMS, ***Dec 95***
MW Lab tests the best 28.8Kbps modems
3400 Pro; Motorola, *01293 404 343*; £157
This modem had the best overall test results. US Robotics Sportster came a close second for its speed and innovative design touches, but the 3400 Pro beat it on price.

★★★ **GeoPort Telecom Adapter Kit**, Apple, *0800 127 753*, £95. Unlocks the software modem built into 680X0AV and Power Macs, providing access to voice, data, and fax services. Our reviewer wanted faster transmission speed and better OCR capability. ***Oct 95***

★★★ **Internet Server Solution for the World Wide Web**, Apple, *0800 127 753*, £2,355. While it's not an ideal solution for all types of Internet publishing, this hardware/software bundle is a starting place for people who want to be publishers, not technicians. ***Oct 95***

★★★★ **TelePort Platinum**, Global Village @ Frontline, *01256 841 841*, £279. If you want V.34 (28.8-Kbps) data and 14.4-Kbps faxing, incoming-call recognition, and an answering machine – all over a single telephone line – Platinum has it all covered. ***Aug 95***

MW LAB

MULTIMEDIA

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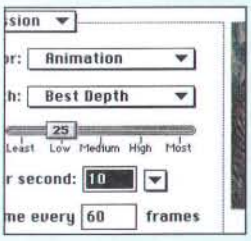

VIRTUALLY THERE, ***Jul 95***
Apple's QuickTime VR lets users explore navigable, photo-realistic 3D worlds

MASTERING MULTIMEDIA, ***Aug 95***
MW Lab tips on video digitizing, sound tracks and printing to video

VIDEO BLOCKBUSTERS, ***Aug 95***
MW Lab tests video-capture boards, under £5,000, to best extend the AV Mac
SpigotPower AV; Radius @ Computers Unlimited, *0181 200 8282*; £999
Attach this board to an AV Mac's DAV slot and you can record, edit and play back 640-x-480 pixel, 30fps, interlaced video. Dropped frames are a problem, but this board handles any job short of broadcast-quality video.

THE PRODUCERS, ***Feb 96***
Gearing up for multimedia

VIDEO NASTIES, ***Mar 96***
How to use Cinepak to avoid the pitfalls of CD movie making

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★★★★/8.4 **Adobe After Effects**, Adobe Systems, *0800 232 223*, £670; £1,360 pro version. Powerful video-effects and broadcast-animation program with top-drawer rendering. If you're a video producer whose work requires digital effects, you need this. ***Mar 96***

★★★★/7.4 **Adobe Premiere 4.2**, Adobe Systems @ Principal, *01706 832 000*, £560. The best general-purpose, QuickTime-based video-editing package available. ***Mar 96***

★★★★/8.2 **Audioshop 2.0**, Opcode @ MCMXCIX, *0171 723 7221*, £150. Easy-to-use, excellent entry-level audio tool.. ***Mar 96***.

★★★★ **Authorware Professional 3.0**, Macromedia @ Peritas, *01753 868 181*, £3,750. Icon-driven media-authoring program minimizes scripting and repetitive labour. Good integration with Director, but can't create anti-aliased text. ***Dec 95***

★★★/6.9 **Boris Effects 1.01**, Artel @ Tyrell, *0171 287 1515*, Premiere version £295, Media 100 version £595. Plug-in adds video-effects control. ***Feb 96***.

★★★ **HyperCard 2.3**, Apple Computer, *0800 127 753*, £87. Latest version of Apple's multipurpose application automates many design tasks, but multimedia presentations won't run on other platforms and colour is treated as an afterthought. ***Nov 95***

★★★★ **MediaPaint 1.0**, Strata @ Gomark, *0171 731 7930*, £480. Anyone who produces QuickTime special effects will welcome this program, which lets multimedia developers edit ranges of frames. Removes much of the tedium of special-effects work. ***Sep 95***

★★★ **Media Suite Pro**, Avid Technology, *0171 434 0122*, £19,950. Relatively affordable entry point to Avid's professional video and film editing systems. Works well for corporate video editing. ***Jun 95***

★★★★ **Media 100 2.0**, Data Translation, *01734 793 838*, £7,995. Offers a route to broadcast quality at a more attractive price than Avid's upgrades to their Media Composer series, though without some of the high-end editing features. ***Jun 95***

★★★★ **Presenter Professional 3.0**, VIDI @ MGA, *0171 229 5502*, £1,850. The improved interface, enhanced animation module, and reduced price of this 3D modelling and animation package make it an excellent choice for multimedia producers. ***May 95***

★★★★/8.2 **Radius Telecast**, Radius, *01483 772 773*, £6,495. Solid and reliable high-end NuBus digital editing system. ***Mar 96***.

★★ **Special Delivery 2.0**, Interactive Media @ Gomark, *0171 731 7930*, £380. Multimedia authoring tool can be confusing and isn't the best choice for complex projects. It may save hours of training for users who need to create simple presentations. ***Apr 95***

★★★ **StoryBoard Artist 1.5**, PowerProduction Software @ Macline, *0181 401 1111*, £365. Build a storyboard by selecting backgrounds, characters, and props from a library. While it's a helpful tool, starving artists will find its price too high. ***Oct 95***

★★★★ **SuperCard 1.7.1** (2.0), Allegiant Technologies @ Gomark, *0171 731 7930*, £299. Multimedia authoring system adds a few welcome enhancements and squashes some old bugs.

★★★★ **Targa 2000**, TrueVision @ Principal, *01706 832 000*, £4,495. High-quality video-editing on the desktop, with very competitive pricing and features. ***Nov 95***

★★★★ **TransJammer**, Elastic Reality @ MacLine, *0181 401 1111*, £745. Plug-in for Adobe Premiere and Avid VideoShop offers 100 customizable video-transition effects, ranging from the conventional to the, well, odd (like falling cows).

★★★ **VideoDirector 1.5** (2.0), Gold Disk @ Frontline, *01256 841 841*, £150. Low-end video-edit system can log, edit, and organize videotape footage, copying from a source deck to a record deck. Good for non-professionals. ***Jun 95***

MW LAB

NETWORKING

REMOTE-ACCESS SERVERS, ***Oct 94***

MW Lab tests ARA links for remote Macs

MIXED NETWORKS: **NetConnect Remote Access Server**; Asanté Technologies @ Principal, *01706 832 000*; £2,810 for eight ports.

For mixed networks requiring PC and Mac connectivity, this offers a superb modular design and outstanding performance, and is easy to configure and use when paired with Asanté's optional interface.

APPLETALK NETWORKS: **ARA Multiport Server**; Apple Computer, 0800 127 753 ; four ports £900, eight ports £1,700.

For AppleTalk-only networks this makes a great addition to an existing AppleShare file server. The ARA Multiport's expandability, performance, and multifaceted management interface combine to create an outstanding remote-access tool.

★★★ **CreativePartner**, emotion Inc. @Designlab, *0171 437 5621*, £1,099. Creative collaboration goes digital with this distribution system for video, sound, text, and graphics. Provides a clever way to send annotations over a network. ***Jul 95***

★★★★ **FileWave 2.1.2**, Wave Research @ Vicom Technology, *01202 293 233*, £671 (20 users), £5,693 (100 users). Maintain a central repository of files and distribute application updates to LAN users with this easy-to-use software-distribution tool. ***Jul 95***

★★★★ **MacAdministrator**, Hi Resolution, *01892 891 291*, £390 (ten-user pack). Network administrators can use this well-designed group-administration tool to control and monitor hardware and software access. ***Dec 95***

★★★ **Pathway Access 3.0**, Wollongong, *01344 304 242*, £295 (£195 if you've already got MacTCP. Very competent for Mac access to TCP/IP-based systems on the LAN – though short on Net cruising features. ***Jun 95***

★★★ **TCP Connect II**, Intercon @ Principal, *01706 832 000*, £339. A veritable Swiss army knife of MacTCP tools, providing everything you need to access the Internet. – though rather bulky. ***Jun 95***

★★★ **RunShare**, Run, Inc. @ Simms International, *0181 870 4020*, from £299. System extension pumps up file-transfer speeds across networks. Two- to threefold throughput gains for fast Macintoshes and large files, but less useful with small files or slow Macs. ***Jan 95***

★★★ **Saber LAN Workstation**, Saber Software, *01344 304 730*, £139 plus £39 per node. LAN-management package includes programs for network administration and remote software updating. Lacks some of the niceties of Macintosh network management software. ***Aug 95***

MW LAB

NEWTON

★★★ **MessagePad 120**, Apple Computer, *0800 127 753*, £425. Apple's PDA offers about three times the storage space of the other PDAs tested, and its design is great. The Newton 2.0 operating system has improved desktop compatibility and handwriting recognition.

★★★★ **Graffiti 1.01**, Palm Computing @ Softline, *0181 401 1234*, £54.95. If you can't seem to teach Newton your handwriting, you can teach your self a new writing system that Newton can handle. Kind of makes you wonder who's running the show, but it works. ***May 95***

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PRINTING

COLOUR BUSINESS PRINTERS, *SEP 95*
MW Lab rounded up colour laser and thermal-wax machines
Tektronix Phaser 340; Tektronix, *01628 403 300*; £3,995
Speed, great output quality and foolproof setup are three good reasons to buy this innovative printer. An optional photocopy attachment is another.

DYE-SUBLIMATION PRINTERS, *JAN 96*
MW Lab tests dye-sub printers for design/publishing proofing
LOW-END: **Fargo Pictura 310**; Fargo @ Bannerbridge, *01268 419 101*, £4,250
You'll need colour-matching software and experience to get the best colour from this machine – and you'll still suffer with sub standard text. But there's no cheaper B-size dye-sub.
HIGH-END: **3M Rainbow 2720**; 3M, *01*, £16,495
The broadest range of proofing options, terrific new peel-and-stick media, and excellent output quality make the Rainbow the printer to buy for the most advanced proofing needs.

WORKGROUP PRINTERS, *JUN 95*
MW Lab tested business laser printers
TABLOID-SIZE PRINTERS: **LaserJet 4MV**; Hewlett-Packard, 208/323-2551; £2,749.
This machine combines fast performance and fine output quality with the ability to print on oversize tabloid stock.
LEGAL-SIZE PRINTERS: **Optra Lx**; Lexmark, 606/232-2000; £2,569.
This superbly engineered printer provides 1,200dpi output and excellent paper-handling options.
LaserWriter 16/600 PS; Apple Computer, 408/996-1010; company's estimated price £1,499.
Although output is not in the Lexmark league, the LaserWriter 16/600 PS provides true PostScript output. And it costs less.

EXPERT PUBLISHING, *Mar 96*
Faster printing tips

★★★★ **Apple Colour StyleWriter 2200**, Apple Computer, *0800 127 753*, £375. Inexpensive, lightweight colour ink-jet printer is ideal for creating colour presentations when you're on the road. ***Nov 95***

★★★★ **Apple Colour StyleWriter 2400**, Apple Computer, *0800 127 753*, £395. Economical, QuickDraw-based colour ink-jet printer offers gorgeous colour output plus fast black-&-white printing. If you don't need DOS/Windows compatibility, it's a good buy. ***Apr 95***

★★★★ **Apple LaserWriter 4/600 PS**, Apple Computer, *0800 127 753*, £625. This PostScript laser printer offers crisp 600-dpi resolution, easy setup and maintenance, and a compact design, at a price of less than £700. ***Dec 95***

★★★★ **Apple StyleWriter 1200**, Apple Computer, *0800 127 753*, £199. Newest model of Apple's inexpensive ink-jet printer offers improved print quality, better halftones, tiled layouts, and four new fonts. ***Sep 95***

★★★ **FotoFun**, Fargo @ Bannerbridge, *01268 419 101*, £349. Dye-sublimation printer produces good output at a very reasonable price. Max output is 4 by 6 inches. Plus nifty mug printing capability. ***Jan 96***

★★★/5.4 **HP CopyJet M**, Hewlett-Packard, *01344 369 222*, £2,600. Colour copier and ink-jet printer in single unit. ***Feb 96***.

★★★★ **HP LaserJet 5MP**, Hewlett-Packard, *01344 369 222*, £970. Meets the high SoHo demands with features such as 600-dpi resolution, support for PostScript Level 2, and automatic-input switching between DOS/Windows machines and Mac networks. ***Jul 95***

★★★ **Phaser 140**, Tektronix, *01628 403 300*, £1,295. If you're looking for a capable colour printer for a small workgroup, this ink-jet is a great choice. It provides only 17 resident fonts, however. ***Apr 95***

★★★ **PrimeraPro**, Fargo @ Bannerbridge, *01268 419 101*, £1,649. The photo-realistic output of this thermal-wax and dye-sub printer beats that of any other printer in the price range. But expensive consumables and slow print time. ***Jan 95***

★★ **Smart Label Printer EZ30**, Seiko, *01628 770 988*, £122. Small, convenient and easy to use label printer– but slow with poor print quality. ***Dec 95***

★★★★ **Stylus Colour**, Epson, *01442 61144*, £559. This colour ink-jet printer is no speed demon at 720-dpi resolution, you need special paper for hi-res output, and it offers no colour correction. But who cares? The print quality is superb. ***May 95***

★★★ **Typhoon 8**, Dataproducts @ Midwich Thame, *01635 577 200*, £2,600 (600 dpi, 4MB of RAM); £4,995 (1,200 dpi, 36MB); ethernet card, £564. Impressive output at 1,200 dpi, but its 600-dpi output and printing speed are nothing to write home about. ***Dec 95***

★★ **Xerox 4510ps**, Xerox @ Midwich Thame, *01635 577 200*, £1,479. Although its driver offers nice features like thumbnail pages, watermarks, and smart underlining, this workgroup printer's speed and output quality don't make the grade. ***Dec 95***

PROGRAMMING

★★★★ **AppWare 1.2**, Novell, *01344 724 000*, £299. Development system offers professional and novice programmers an efficient, graphical method of creating commercial or in-house applications. ***Oct 95***

★★★★/8.4 **CodeWarrior Gold 7**, Metrowerks @ Full Moon Software, *01628 660 242*, £275. Wildly popular development system for the Mac, with good reason. It has few faults and many virtues. ***Mar 96***.

★★★★ **FaceSpan 2.0**, Software Designs Unlimited @ Full Moon, *01628 660 242*, £139. Programmer's tool lets you quickly build AppleScript interfaces. New features such as drag-and-drop functions and tables make it easy to create stand-alone applications. ***Nov 95***

★★★★ **JAM 6**, JYACC, *0171 814 6660*, £2,400. Thanks to this well-designed tool, the Mac is now a viable platform for development of large-scale corporate client-server database applications. ***Oct 95***

★★★★/8.0 **LS FORTRAN 1.1**, Fortner Research @ Full Moon Software, *01628 660 242*, £479. FORTRAN rides again, running science programs on the Power Mac desktop. ***Feb 96***.

Macworld star ratings • Macworld star ratings • Macworld star ratings • Macworld star ratings

★★ **ScriptWizard 1.0** (1.5), Full Moon Software, *01628 660 242*, £59. Software attempts to make writing and debugging AppleScript scripts easier. But it doesn't offer enough improvement over Apple's Script Editor.

★★★ **Symantec C++ 8.0**, Symantec, *01628 592 222*, £339. The new version of this development environment offers native PowerPC compilers for C++ and ANSI C. The project manager and class browser have been improved and the compiled code is laudable, but our reviewer had some complaints about the package's resource demands and the company's support reputation. Jul 95 a

★★★★ **VIP-C 1.5** (1.5.1), Mainstay @ Computers Unlimited, *0181 200 8282*, £299. For convenience in producing 680X0/Power Macintosh applications, this programming utility is a fine investment.

MW LAB

SCANNERS

HIGH-BIT FLATBED COLOUR SCANNERS, *MAR 95*

Arcus II; Agfa, *0181 560 2131*; £3,250.
Top ratings in every category except for speed, plus full-featured software, make this a winner. But the scanning speed is atrocious – though recently upgraded since this test.

PowerLook; Umax @ IMC, *01753 830 999*; £3,495.
This scanner turned in good or excellent ratings in almost every category. It's very fast, and its software is a pleasure.

SLIDE SCANNERS, *Dec 95*

MW Lab tests digital slide scanners for speed, image quality and value

Polaroid SprintScan 35; Direktek, *0181 845 5969*; £1,750
Nikon Super Coolscan; Nikon, *0181 541 4440*; £1,795
Microtek 35T; Microtek @ CU, *0181 200 8282*; £795
No single scanner can meet all needs – in terms of resolution, speed or features – or fit all budgets. The good news is that there are two good choices in the moderate price range. And the Microtek 35T performs honourably – if slowly – at a much lower price.

★★★ **Fujitsu ScanPartner Jr**, Fujitsu, *0181 573 4444*, £399. Compact scanner with good OCR software makes converting hard-copy documents to editable text a snap. It's an economical and fuss-free scanning solution, but its page-feeder doesn't offer the flexibility of a flatbed scanner. ***Jul 95***

★★★★ **HP ScanJet 3c**, Hewlett-Packard, *01344 361 276*, £839. Higher resolution (600 dpi) and a broader dynamic range (30 bits) distinguish this colour scanner from its predecessor. The only number that didn't go up is the price. ***Oct 95***

★★★★ **Nikon Super Coolscan**, Nikon, *0181 541 4440*, £1,795, optional auto-feeder £550. Compact slide scanner with auto-focus and accurate colours, as well as friendly user interface. ***Nov 95***

★★★★★/9.6 **PaperPort Vx**, Visioneer @ Computers Unlimited, *0181 200 8282*, £299. The paperless office is actually here. This clever combination of elegant hardware and intelligent software makes it easy to capture, organize, and retrieve documents. Once a page is scanned in (400dpi greyscale), you can annotate it; run it through OCR software; or print, fax, or e-mail it. ***Mar 96***

★★★★/8.4 **Primax Datapen**, Primax UK, *01235 559 922*, £120. Easy-to-use, excellent OCR-friendly handheld scanner. ***Mar 96***

★★★★ **SprintScan 35**, Polaroid @ CU, *0181 200 8282*, £2,450. Compact, efficient scanner offers a cost-effective way to transfer images from 35mm slides or negatives to a Mac. ***Jun 95***

★★★ **Vista-S8**, Umax Technologies @ IMC, *01753 830 999*, £1,195 (LE+); £1,890 (Pro+). This 24-bit colour flatbed scanner has a lot of useful features for its low price, including crisp line-art scans and speedy previews. It's a bargain if you can overlook its slow OCR scans and some scanning-software bugs. ***Jul 95***

MW LAB

STORAGE

LIGHT FANTASTIC, *Dec 94*

MW Lab tests high-capacity optical drives

Wave 1.3GB MO; Wave @ Computer Capability, *01392 444 840*; £1,398.
Price coupled with the reputation of the British manufacturer makes it a good choice.

BACK-UP, *May 95*

Find the best tape drives for your requirements

IT'S A RAID, *Apr 95*

Does RAID (Redundant Array of Independent Disks) deliver on its promise of fast, secure storage?

SUPERFAST STORAGE, *Jul 95*

SCSI-2 fast/wide drives and cards give maximum performance

★★★★ **EZ135**, SyQuest, *0131 339 2022*, £179; 135MB cartridge £12.50. Currently the fastest removable drive available. Easy to set up, but not compatible with existing removable formats. ***Dec 95***

★★★ **SledgeHammer8000FT**, FWB @ Midwich Thame, *01379 649 200*, from £15,500. This fault-tolerant Level 5 RAID array will help you maintain constant access to your stored information. Our reviewer couldn't tolerate a few of its faults, however, including its lack of support for RAID 3.

★★★★ **Zip Drive**, Iomega, *0800 898 563*, £149; 100MB cartridge £18. Weighing in at about a pound, this external drive combines speedy performance, convenience, and economy in an attractive package. It uses 100MB cartridges the size of a floppy disk, and boasts near hard-drive speeds. What's not to like? ***Jul 95***

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Mac Update: Products & Services

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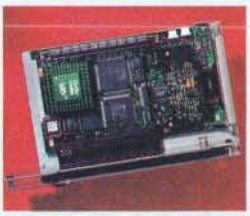
MW LAB — UPGRADES AND ACCELERATOR BOARDS/SYSTEMS



ALL CHANGE, *Jun 95*
How the switch from NuBus to PCI will benefit you

UPGRADE TO POWER MAC, *Feb 95*
MW Lab looks at the current upgrade path to PowerPC

Next Month: Macworld Lab selects the best Macintosh solutions for SoHo, portable computing, graphics and publishing, business and professional, media authoring, and science and engineering.

★★★ **Apple PCMCIA Expansion Module**, Apple Computer, *0800 127 753*, £110. Well-integrated, well-designed unit offers 500-series users an efficient and easy albeit expensive way to add features to their PowerBooks. If you can overlook the early-adopter prices (a big if), the PC Cards are great expansion options. ***Mar 95***

★★★★ **DayStar Turbo 601**, DayStar Digital @ Macline, *0181 401 1111*, £1,299. Squeeze more performance out of your Mac with this impressive 601-based accelerator card. ***Sep 95***

★★★ **EAsycolor 24/1360**, EA Research @IMC, *01753 830 999*, £1,895. Video board offers Photoshop CMYK–mode acceleration and high-res support for multisynchronous monitors. Only adequate QuickDraw acceleration, but it's affordable. ***Aug 95***

★★★ **PaintBoard Prism GT**, RasterOps @ Principal, 01706 832 000, £1,099. If you want QuickDraw acceleration and plentiful software options, this video board is a good choice, but it doesn't offer Photoshop acceleration. ***Aug 95***

★★★★ **Photo Engine**, Radius @ Computers Unlimited, *0181 200 8282*, £1,099. Photoshop acceleration hardware's suite of four 66MHz 32-bit DSP chips offers sufficient processing power to speed up 25 Photoshop functions on the most sophisticated systems, including Power Macs. ***Feb 95***

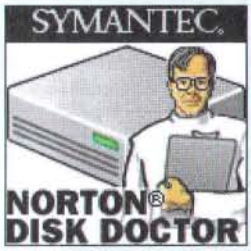
★★★★ **PowerShop**, Adaptive @ Cromenco, *01732 867 002*, £1,995. Expensive but very fast Photoshop accelerator. ***Jan 96***

★★★/5.1 **SCSI PowerPlug II**, Hot Wire Technology @ AM Micro, *01392 426 473*, £99. A fast way to swap SCSI devices ***Feb 96***.

★★★★ **SpigotPower AV**, Radius @ Computers Unlimited, *0181 200 8282*, £999. Make full-screen, 30-fps movies with this first-rate video-compression-and-decompression board and accompanying JPEG software. ***Jun 95***

★★★★ **Thunder IV GX 1360**, Radius @ Computers Unlimited, *0181 200 8282*, £2,999. With its impressive QuickDraw and Photoshop acceleration and versatile software, this video board was our reviewer's first choice. It's more expensive than the competition, however. ***Aug 95***

MW LAB — UTILITIES



TOMORROW'S SYSTEM TODAY, *Jun 95*
Enhance System 7.5's productivity and performance with essential utilities

DIG DEEPER, *Feb 96*
A guide to faster, more powerful file searches

MAKE A NOTE, *Mar 96*
The secret life of Stickies

★★★ **Aladdin Desktop Tools 1.0**, Aladdin @ Principal, *01706 832 000*, £80. Not all the utilities in this collection are perfectly implemented, but Desktop SpeedBoost and Desktop Printer make the package worth its price. The rest can be considered a bonus. **Aug 95**

★★★ **Arcserve for Macintosh 1.5**, Cheyenne Software, *01737 775 500*, £175 (5 users). A good backup program for mixed-platform networks. **Jan 96**

★★★★ **At Ease 3.0 for Workgroups**, Apple Computer, *0800 127 753*, £115. Network administrators can choose from three levels of access for users with Apple's program launcher. ***Nov 95***

★★★ **CanOpener 3.0**, Abbott @ AM Micro, *01392 426 473*, £89. You can use this handy utility to open many types of files, but it falls a little short in the file-search department. ***May 95***

★★★★ **CD Directory 1.0**, Insignia Solutions, *01494 459 426*, £49. Store catalogues of CD directories on your hard drive – and access them at hard drive speeds – with this handy utility. One complaint: catalogued CDs are treated as local drives, greatly increasing search time during a global search. ***Jul 95***

★★★ **Color Compass 1.0** (1.1), Praxisoft @ MacWarehouse, *0800 181 332*, £125. Speedy, specialized tools allow you to blend, match, and tweak colours in subtle ways not possible in most programs. Although graphics experts might not need this program, it provides helpful visual feedback for creating and organizing colour palettes. ***Aug 95***

★★★★★ **Conflict Catcher 3**, Casady & Greene @ Softline, *0181 401 1234*, £69. This extension-management utility was already great – and it just got better. Like a digital Jimmy Carter, it offers a friendly, flexible approach to conflict resolution. ***Sep 95***

★★★ **Disc-To-Disk**, Optical Media International @ Computers Unlimited, *0181 200 8282*, £159. Audio-capture utility's friendly interface provides a simple way to transfer sound from a CD to the Mac's hard drive. A useful tool for multimedia authors. ***Jun 95***

★★★★ **DiskGuard 1.0.1** and **DiskGuard Remote**, ASD Software @ Softline, *0181 401 1234*, from £89. Rock-solid, flexible disk-protection tools are worth serious consideration if your Mac or Macs are accessible to other users.

★★★/6.8 **DOS Mounter 95**, Software Architects @ Softline, *0181 401 1234*, £70. You'll love the ease of transferring files between platforms – just watch out for those name truncations. ***Mar 96***

★★★★ **FolderBolt Pro 1.0.3**, Kent Marsh @ Ingram Micro, *01908 260 160*, £77. Top-notch encryption schemes and flexible access controls let you secure your Mac's contents by password-protecting folders and encrypting the data they contain. ***Jul 95***

★★★ **Gear 2.5**, Elektroson @ ADR, *01483 725 054*, £435. CD-recordable mastering software is a mixed bag. It's speedy and reliable, but can't record HFS CD-ROMs from just part of a hard drive without additional software. ***Sep 95***

★★★ **Here & Now 1.0**, Software Architects @ Softline, *0181 401 1234*, £69. OK. We admit it. Lots of people use DOS and Windows. This utility modifies Mac files so you can read them on a PC. ***Dec 95***

★★★★ **InstantReplay 1.0**, Strata @ Gomark, *0171 731 7930*, £110. Now you see it, now you see it again. This utility records on-screen activity and saves it as a QuickTime movie, including audio. File-conversion capabilities are an added bonus. ***Sep 95***

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★★★★ **Kaboom 3.0**, Nova Development Corp.@ Amtech, *01179 710 588*, £39. Sound-effects utility with sound-editing application is a fun program for anyone who wants to play with sound. ***Feb 95***

★★★★ **Launch Pad 1.0**, Berkeley Systems @ Softline, *0181 401 1234*, £39. If you want to share your Mac with your kids, this desktop utility is a worthwhile investment. ***Jan 95***

★★/4.5 **MacOpener**, dataViz @ Principal, *01706 832 000*, £51. Inferior file-transfer utility. ***Mar 96***

★★★ **MacTools Pro 4.0**, Symantec Corp. @ Principal, *01706 832 000*, £99. This utility does a good job of diagnosing and fixing disk problems, but suffers from large RAM requirements and expensive tech support. ***May 95***

★★★ **Multimedia Utilities 1.1**, Motion Works @ *0171 731 7930*, £191. Six utilities address QuickTime moviemaking, from editing movies and sound tracks to creating morphs, animations, and screen recordings. Although the utilities are appealing, you must save early and often because of frequent crashes. ***Jul 95***

★★★★ **Norton DiskDoublerPro 1.1**, Symantec Corp., *01628 592 222*, £79. Utility collection includes DiskDoubler, AutoDoubler, and CopyDoubler. Because of its ease of use, the product is a good choice for beginners. ***Feb 95***

★★★ **Norton Utilities for Macintosh 3.1**, Symantec Corp. @ Principal, 01706 832 000, £99. Data-protection and -recovery utility collection is leaner, meaner, and faster than ever before, but it's also surprisingly uneven. While Disk Doctor leads the pack for disk-repair utilities, the back-up module is weak and the new UnErase module is missing some features. ***Feb 95***

★★★★ **Now Utilities 5.0**, Now Software @ Ingram Micro, *01908 260 160*, £69. Three of the modules of this fine-tuned, interlocking utility set – Now FolderMenus, Now Menus, and Now SuperBoomerang – are almost indispensable, and while the other six may not be tops in their category, they're well worth considering. ***Jan 95***

★★★ **On Cue II Utilities 3.0**, ComputerEasy International @ FastCAD Europe, *01923 246 427*, £99. Eight modules add functionality to the Mac Operating System. It's useful, but not as comprehensive as the competition. ***Sep 95***

★★★★ **OptiMem RAM Charger 2.0.1**, Jump, 001 412 681 2692, $72.90. Use RAM more efficiently with this memory-management utility. The Mac OS ought to work like this, but until it does, you should use this nifty utility. ***Jul 95***

★★★★ **Power Secretary Power Edition 2.0**, Articulate @ Voiceworks, *0181 455 4750*, £1,495 (full version), £895 (WordPerfect only). This impressively accurate, if expensive, speech-recognition program provides a viable alternative to keyboard input. ***Sep 95***

★★★ **RapidCD 1.04**, Insignia, *01494 459 426*, £49. RAM and disk caching of CD-ROM data speeds access to frequently used data. This utility does its job well, but it's incompatible with the AppleCD Audio Player and doesn't allow you to add to its settings. ***Jul 95***

★★★★/8.4 **SCSI Director Pro 4.0**, Transoft @ StudioBox, *01734 502 556*, £95. Hard-disk formatting and testing utility. ***Feb 96***.

★★★★ **S/Link 2.0**, Synclavier @ Sterling Audio, *0171 625 6070*, £249. Batch processing is this audio-conversion utility's specialty. It supports all major audio file formats and offers a straightforward interface. ***Nov 95***

★★★★ **SAM 4.0**, Symantec, *01628 592 222*, £149. Comprehensive virus protection can be sluggish. ***Feb 95***.

★★★★/8.9 **Speed Doubler 1.0.2**, Connectix @ Computers Unlimited, *0181 200 8282*, £59.95. Makes a Power Mac's 680X0 emulation feel native. ***Feb 96***.

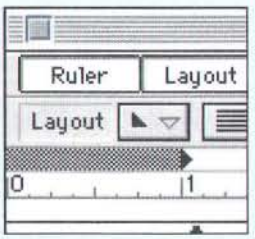
★★★★ **Stuffit Deluxe 3.5**, Aladdin @ Principal, *01706 832 000*, £80. If you're looking for a compression solution, you should look at this. Drag-and-drop applications, Magic Menu, and file translators make it easy to integrate compression into your routine. ***Mar 95***

★★★★ **Virex 5.5.1**, Datawatch @ Softline, *0181 401 1234*, £75. Comprehensive, reliable, and speedy utility helps protect files from those misguided lads who get their jollies by releasing viruses. To keep it current, updates are available on online services. ***May 95***

★★★ **Zonkers 1.0**, Nova @ Amtech, *0102 476 977*, £37. Redecorate your Mac with this collection of silly desktop enhancements. Customize icons, scroll bars, cursors, buttons, menu bars, windows, and desktop patterns to create your own look. ***Jun 95***

MW LAB

WORD PROCESSING



WORD PROCESSORS, *MAR 95*

Flexibility and power for creating long, complex documents (high-end)
Speed, features plus slim memory and disk requirements - and price (low-end)

HIGH-END: **Microsoft Word 6**; Microsoft, *01734 270 000*;£159.
More often than not, Word 6 performs complex tasks better and more easily than any other word processor. But don't upgrade from Word 5.1 unless you actually need the extra bells and whistles.
LOW-END: **MacWrite Pro**; Claris, *0181 756 0101*;£150
MacWrite pro is fully featured and sparing of memory. Its style sheets, tables, word count, WYSIWYG font menu, footnotes and table-of-contents features are easy to figure out – even without the excellent manual. But the price is a bit steep.

★★★ **Microsoft Word 6.0**, Microsoft Corp., *01734 270 000*, £222. If you can put this word processor's new features – including cross-referencing, AutoText, automatic numbering, macros, and more – to work and you have a Quadra 650 or faster Mac, take the plunge. If you have a slower 68040 Mac, think twice; and if you have a 68030 Mac, don't even think about it. ***Feb 95***

★★★★ **EndNote Plus 2.0**, Niles & Associates @ MacLine, *0181 401 1111*, £195. Despite its power, this indispensable bibliography and citation manager is surprisingly easy to learn and use. If you have to work with references, it's a good choice.

★★★ **Grammatik 6 for Macintosh**, Novell @ MacLine, *0181 401 1111*, £32. The low price, pleasant interface, and improved accuracy of this grammar checker make it worthwhile for a large number of quality-driven writers. It still misses some errors.

★★★ **Nisus Writer 4.0**, Nisus Software @ Softline, *0181 401 1234*, £255. In a few specialized areas – such as mixing English and non-Romance languages – this word processing program is unmatched. ***Mar 95***

★★ **Read-It O.C.R. Pro 5.0**, Olduvai Corp. @ MacWarehouse, *0800 181 332*, £149. Although this OCR software has a nice collection of features, its recognition engine isn't up to par. It's not a first choice unless you simply need to process piles of very clear Courier text. ***Apr 95***

★★★ **Three by Five 2.0**, MacToolkit @ Softline, *0181 401 1234*, £99. How retro! This idea organizer uses the metaphor of index cards on a corkboard. Unlike real cards, the program lets you attach QuickTime movies, link cards, or switch to an outline view. ***Aug 95***

★★★/6.7 **WordPerfect 3.5**, Novell, *0800 525 321*, £125. Popular word processor adds HTML editor. ***Feb 96***

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Macworld

Peter Worlock

New broom is no brush off

There's every reason to be optimistic about Apple

The dust has settled, the clamour has died away and, lo! Apple Computer is still in business. The company didn't die! It didn't even get sold to Sun Microsystems, IBM, Oracle or anyone else. There are changes at the top, however – it seems that US executives, unlike British ministers, are willing to accept responsibility).

As expected, former chief executive Michael Spindler has gone. More surprisingly, chairman of the board AC "Mike" Markulla has stepped down to the role of deputy-chairman.

Replacing them both is Gil Amelio who, as I write this, has been in the Apple hot seat for less than a month. Of course, that's too soon to make any real judgments about his plans or his ability, but we can say that he's started well in both what he has done, and what he hasn't.

He has admitted Apple's recent mistakes (for which he also has some responsibility; he's been a member of the Apple board of directors for nearly 18 months). He has promised that Apple will be much more open about its plans, and much more vociferous in proclaiming the benefits of the Mac.

Equally important, he hasn't dashed in and started slashing costs, laying off staff, killing projects and generally coming the corporate hard man.

Gil's influence

It looks as though he is prepared to be patient, work out the real problems, and try to come up with the best solutions. He has, however, done one significant thing in his short reign: he has kick-started the Mac OS licensing programme, leading to the deal with Motorola, which was expected to be among the first licensees back in 1994. Only the influence of Amelio can explain the sudden conclusion of the deal this late in the game.

Motorola's licence is significant in many respects. It is by far the biggest name to sign up to the Macintosh cloning programme; it has the right – unlike earlier licensees – to sub-license the OS to anyone who wants it. And as one of the original partners in the PowerPC chip venture, and the PowerPC Reference platform design, it may be able to create a new business designing and selling Macintosh OS motherboards to manufacturers and assemblers (just as Intel now designs and makes most of the motherboards in the PC business).

In other words, Motorola's presence may do more to revive the moribund Macintosh-compatible clone business than anything else that Apple could have done.

Of course, none of this means that Apple is out of the woods yet. This month's announcement of a new range of servers (see News) doesn't look thrilling at all. The Internet servers are fine, and that's an area where Apple has a sales story to tell, but servers for the workgroup and departmental level don't make sense when the only game in that town is Novell Netware vs Windows NT.

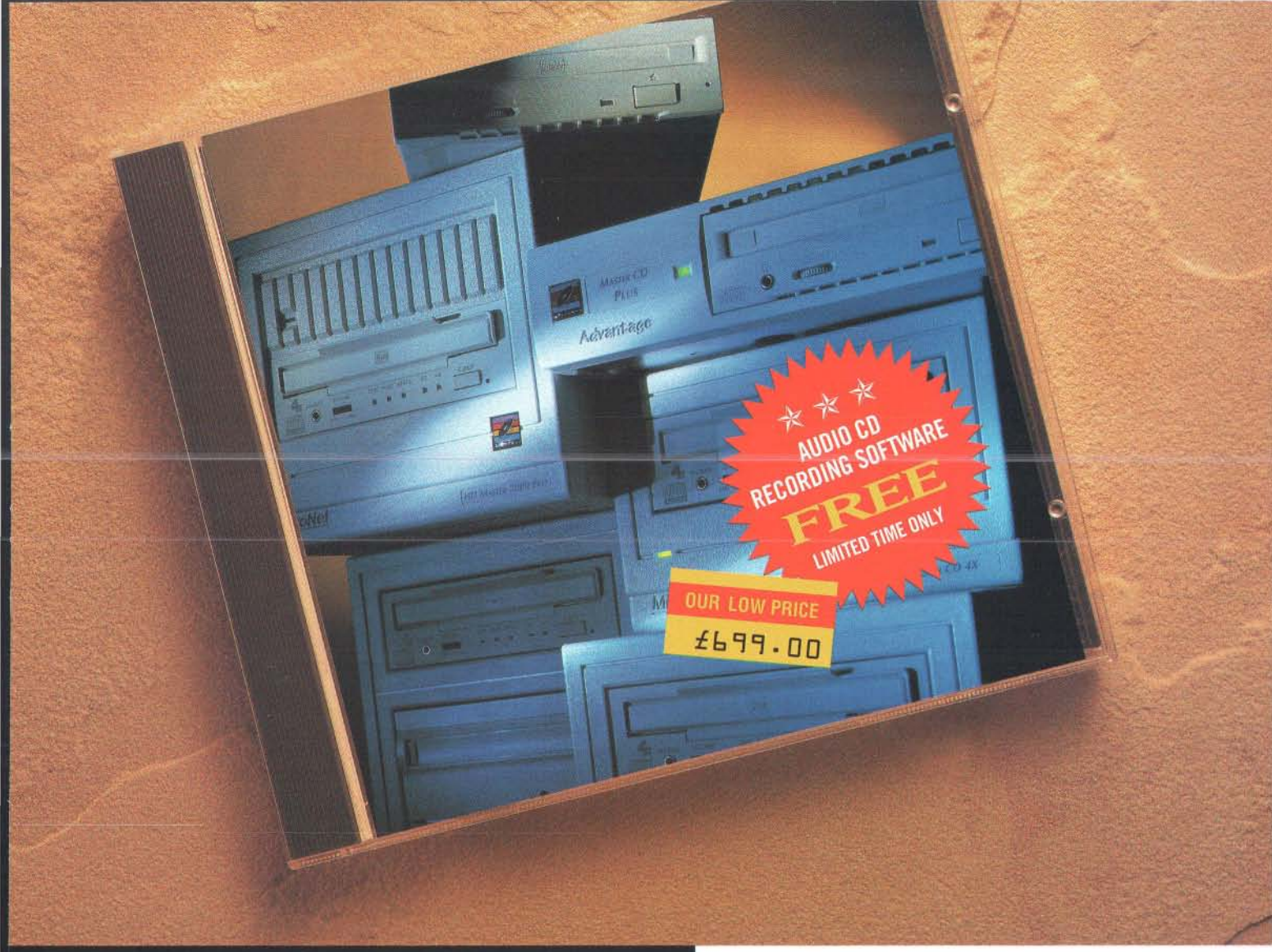
Apple also needs to slim down the desktop line, it needs to rethink its previously successful PowerBook range, and it needs – perhaps more than anything else – to ship Copland.

But there are encouraging signs that the company is prepared to do what's necessary to turn itself around.

As we've seen, Dr Amelio is ready to sacrifice some sacred Apple cows to get the job done – such as giving operating system licensees the rights to future versions of the Mac OS like Copland, rather than forcing them to come back for every OS revision, which is how it used to be.

Be prepared for another blitz of bad publicity in April, when Apple posts another financial loss (we know it's coming, Apple has said it's coming, but most newspapers and PC magazines will behave as if it's devastating news).

But, in reality, there's every reason to be quietly optimistic – about Apple, about the Mac, and about the future. MW



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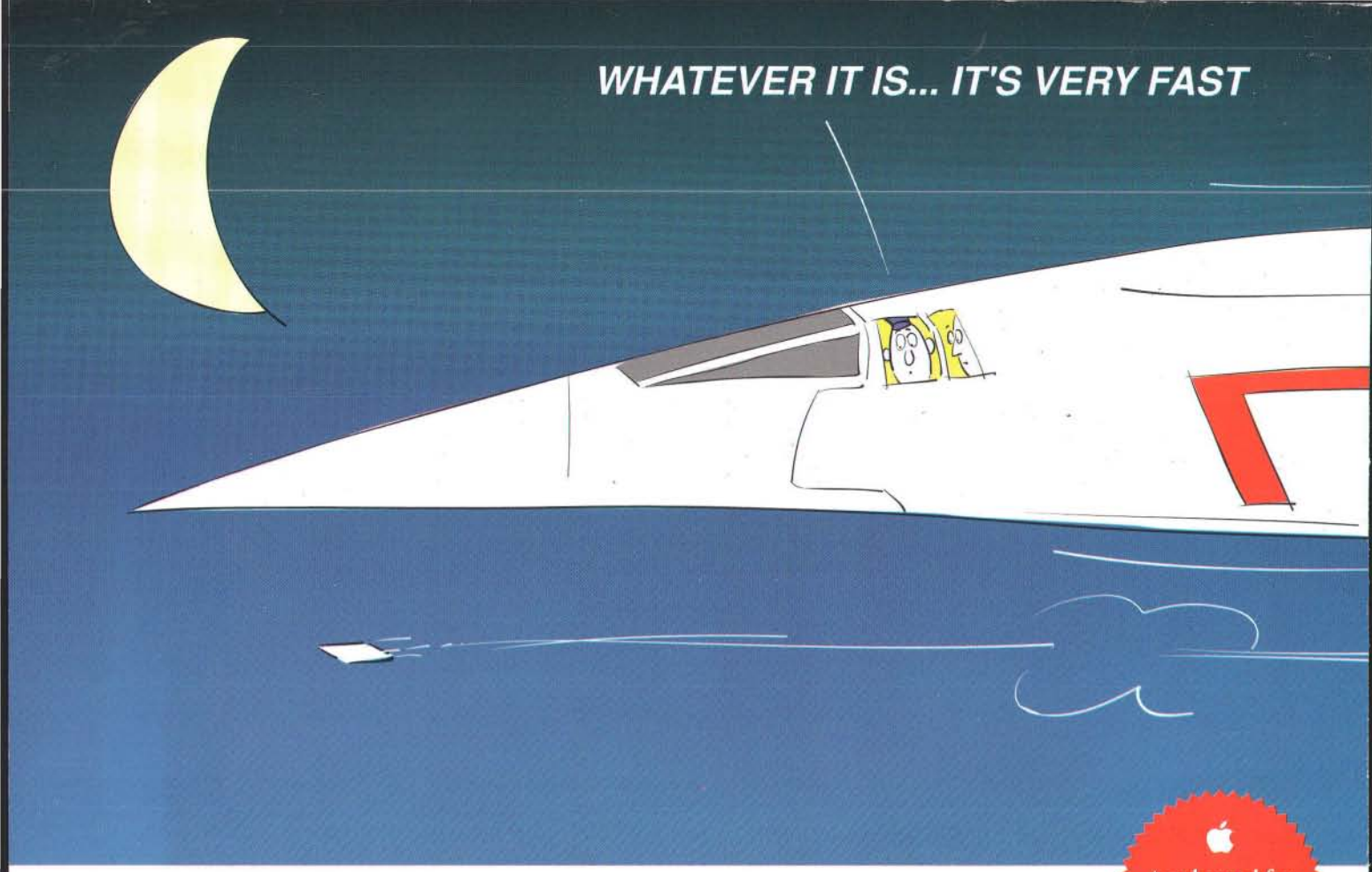

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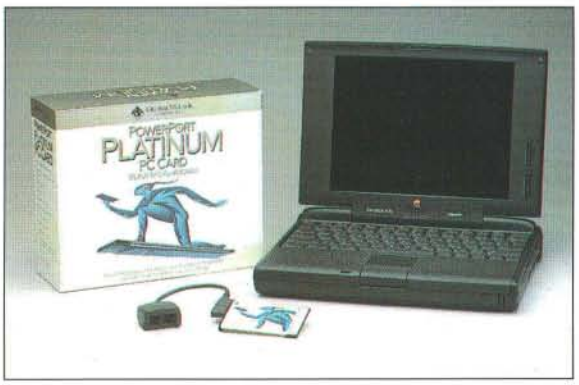

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